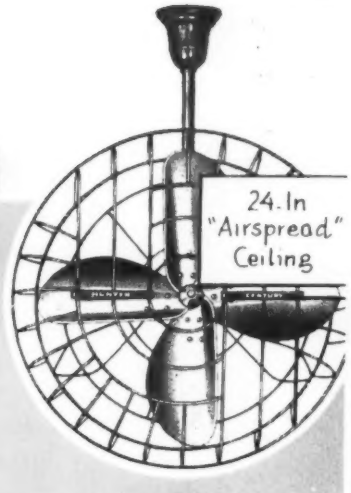
ELECTRICAL SOUTH

NOVEMBER
1944

52-In Hotel Type

55th SEASON



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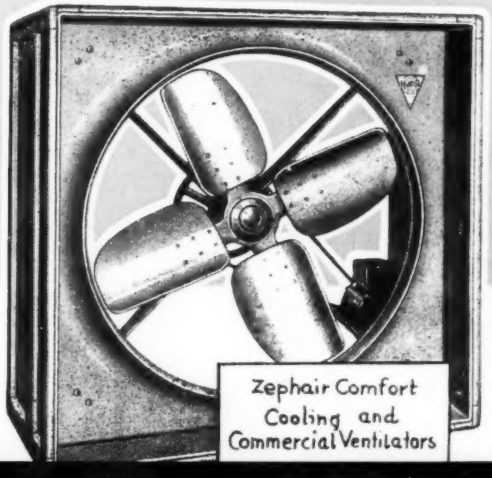

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Then specify the Westinghouse line of "Tuffernell" Insulating Materials. They're the result of *fifty years of field tests* with every type of electrical equipment.

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J-06358

Hang up this new Insulation Sample Book for handy reference. It simplifies selection, ordering and application of Micas, tapes, fabrics and papers.

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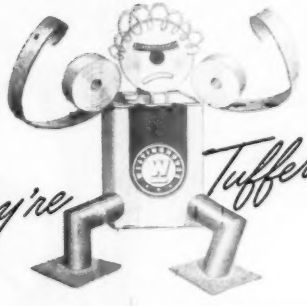

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Volume 24 Number 11

GET RID OF THE Sacred Cow IN WIRING!
In electrical wiring of buildings, the costly custom of using No. 14 has blocked progress toward adequate wiring like the sacred cow on an Indian road. The Hindu, you recall, reveres the cow and will not disturb it, regardless of time or place. But, if our buildings of tomorrow are to have proper wiring, then sacred cows like No. 14 must yield to progress.
A first and basic step towards realization of the adequately wired building should be insistence that the sacred cow of No. 14 must go. Its anemic circuits have deprived many a building of full use of available power. To take full advantage of the electrical world of tomorrow, wiring must be planned with an eye to the future for the greater use of electrical equipment. The Okonite Company, Passaic, N. J
OKONITE and HAZARD
insulated wires and cables
To wire a building adequately, no smaller wire than No. 12 should be specified. Only one size larger, it will carry one third more current, reduce voltage drop by more than a third, deliver more power for your money and yet requires no larger conduit or fittings.
ADEQUATE WIRING
THE KEY TO INCREASED PRODUCTION
3824

guess I had better ALWAYS figure on nothing smaller than #12 when quoting ARCHITECTS and OWNERS after this!!!

SAFETY is a prime factor in the construction of Type AC THERMAG CIRCUIT BREAKER PANELBOARDS

All current-carrying parts are permanently covered —careless hands can't touch them . . . Needless circuit interruptions are prevented when harmless, momentary overloads occur—but the circuit breakers "trip" on short circuit or harmful, sustained overload . . . These circuit breakers are operated like an ordinary tumbler switch. Simply return the handle to the ON position when the cause of the short circuit or overload has been removed.

They afford modern protection with ease of operation, and are built for long life — these circuit breakers are Underwriters' Laboratories tested *for ten thousand complete operations.*

The cabinets are designed with ample gutter space and plenty of knockouts to expedite installation. FA Pressure Type (Solderless) Connectors on mains facilitate connection.

FA Type AC Thermag Circuit Breakers are assembled in Panelboards of 4 to 42 branches, for light and appliance service, in standard, narrow column type, and dust-tight cabinets — for either surface or flush mounting. Branch circuit capacities: 15 to 50 amperes, 120 volts AC, for 3 wire single phase or 4 wire three phase mains . . . Mass production of FA Panelboards is attained by the use of standardized units as component parts. This results in equipment of high efficiency at lowered cost.

Write for Bulletin 67

It contains complete descriptions, dimensions, capacities, wiring diagrams, prices and suggested specifications. You'll find it helpful . . . Frank Adam Electric Company, Box 357, St. Louis 3, Mo.

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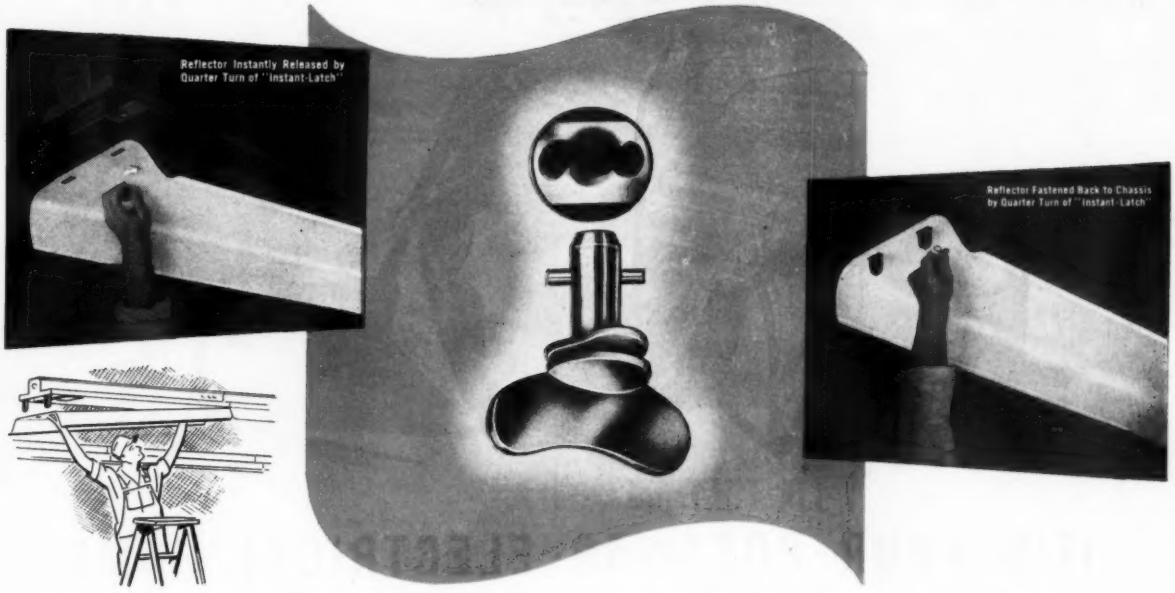
Speeds Installing, Cleaning, Servicing

OF THE NEW

MITCHELITE ALL-STEEL FIXTURES


Reflector Instantly Released by Quarter Turn of "Instant-Latch"
Reflector Fastened Back to Chassis by Quarter Turn of "Instant-Latch"

A simple quarter-turn of Mitchell's new aircraft type "Instant-Latch" attaches or releases the reflector . . . instantly. No tools needed. This "Instant-Latch" is a strong cam-type fastener which provides positive tension at all times. No amount of vibration will loosen it. All parts permanently attached—no fussing with small removable parts. No spring to wear out. Two such latches are secured on each reflector.

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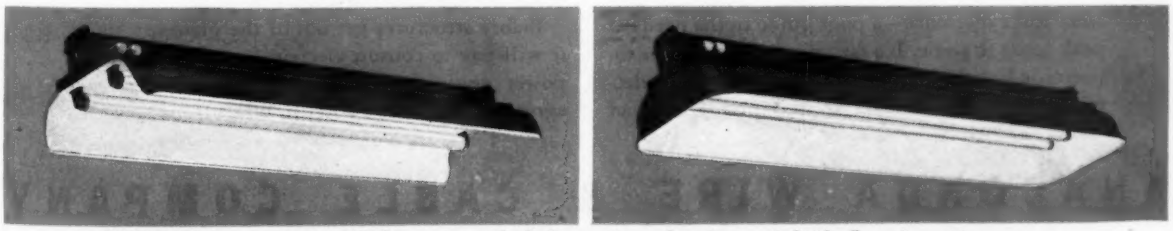

MITCHELITE Accessories provide for every method of mounting or hanging . . . individually or in continuous rows.

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Manufacturers! Apply this in terms of industrial equipment in *your* business. The problem's the same. Make sure you have ample electrical capacity to meet the huge future increases in electrical usage sure to come. In plants too, planned wiring will cost a lot less than unplanned wiring.

Before structures get out of the planning stage, it will pay to consult electrical contractor, utility power engineer, plant power engineer. They'll agree that it's always wiser to *Wire Ahead!* 44366

ANACONDA WIRE & CABLE COMPANY

25 Broadway, New York 4 . . . Sales Offices in Principal Cities

It's Always Wiser to TELEGRAM WIRE TELEGRAM AHEAD

ANACONDA

ELECTRICAL SOUTH

VOL. 24 NOV. 1944 NO. 11

T. W. McALLISTER, *Vice Pres., Editorial Director*

CARL W. EVANS, *Editor*

BARON CREAGER, *Southwestern Editor*

FRANK P. BELL, *Business Manager*

W. E. COOGLER, *Production Manager*

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Business Representatives

L. E. ALLEN, 189 W. Madison St., Chicago, Ill. Tel. Lakeview 10282.
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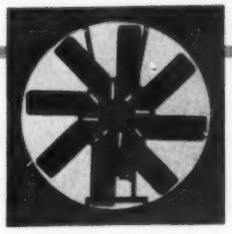
It's IMPORTANT That You Take Orders NOW!

Coolair TRADE MARK

EXHAUST FANS and BLOWERS



Wise dealers are continuously on the job every day soliciting orders — and *selling* orders for COOLAIR Fans and Blowers! We are in the position to handle your orders on an "order first — shipment first" basis, so it is important that you help your customers anticipate their needs early — and order early!

CONTACT ALL PROSPECTS NOW

- because—CMP Regulations permit almost any type of business, able to certify that the equipment they order is necessary to the successful operation of their business, to assign their own preference ratings on purchases up to $500. Form WPB 541 (Formerly PD-1A) can be filed for orders in excess of $500.
- because—many Government orders are still available to wide-awake dealers who keep in touch with these prospects.
- because—by selling your customer on an "order first—shipment first" basis, he will be assured of as prompt delivery as possible.

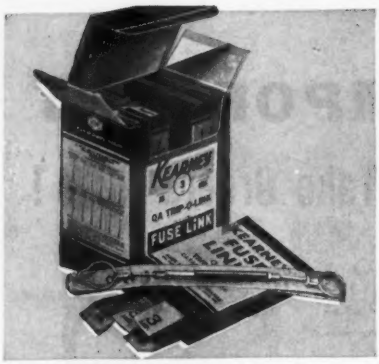
DON'T DELAY — START TODAY . . . contacting every likely prospect. We will be glad to help you with any priority problems that may arise. Send for a supply of the latest Coolair literature and the 1944 price list.

A full description of the Coolair line, with tables showing models, dimensions, performance data, etc., can be found in SWEET'S CATALOG A.S.H.V.E. GUIDE ELECTRICAL BUYER'S REFERENCE

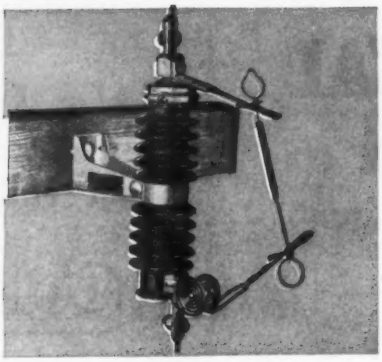
AMERICAN COOLAIR CORPORATION . . . Manufacturers

3604 MAYFLOWER STREET

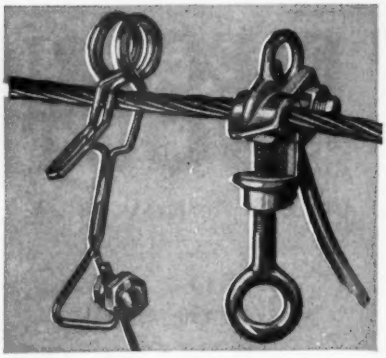
JACKSONVILLE 3, FLORIDA



FUSE LINKS—individually wrapped, then packaged again in packets of five, arrive at the pole just the way they leave the Kearney factory.

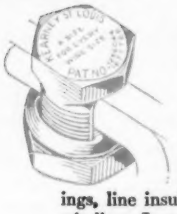


LOW MASS, extra-flexible switch parts mean high resistance to mechanical shock and heavy short-circuit rupturing capacity.



CLAMPS. There is a Kearney Con-nec-tap clamp for the most unusual load or construction problem. Made in many types for all wire sizes.

COMBAT LIGHTNING THE EASY WAY



Are you trying to combat lightning discharges the hard way? You are if you're using devices that attempt to choke surges by interposing a high resistance in the path to ground. This method has the effect of keeping a high percentage of the surge on your lines where it may spill over bushings, line insulators or break through transformer windings. In consequence these choked and reflected surges are the direct cause of the many outages from fuse link blowings if not more serious damage, after lightning storms.

The easy way is to direct lightning surges to ground through a low resistance path so that all of the surge, electrical stress and reflected voltage is drained to ground within a fraction of a microsecond. Power follow-ups are snuffed out usually within the first current zero and your lines will operate through many lightning storms without even blowing a fuse link. This is what you may confidently expect when you change to Kearney Lightning Arresters. What's more you start off with the initial advantage of paying much less for the Kearney Arresters—and they will continue to pay dividends by reducing fuse-blowings, trouble-trips and lightning outages to a new low.

Please address your letter to Department "H".

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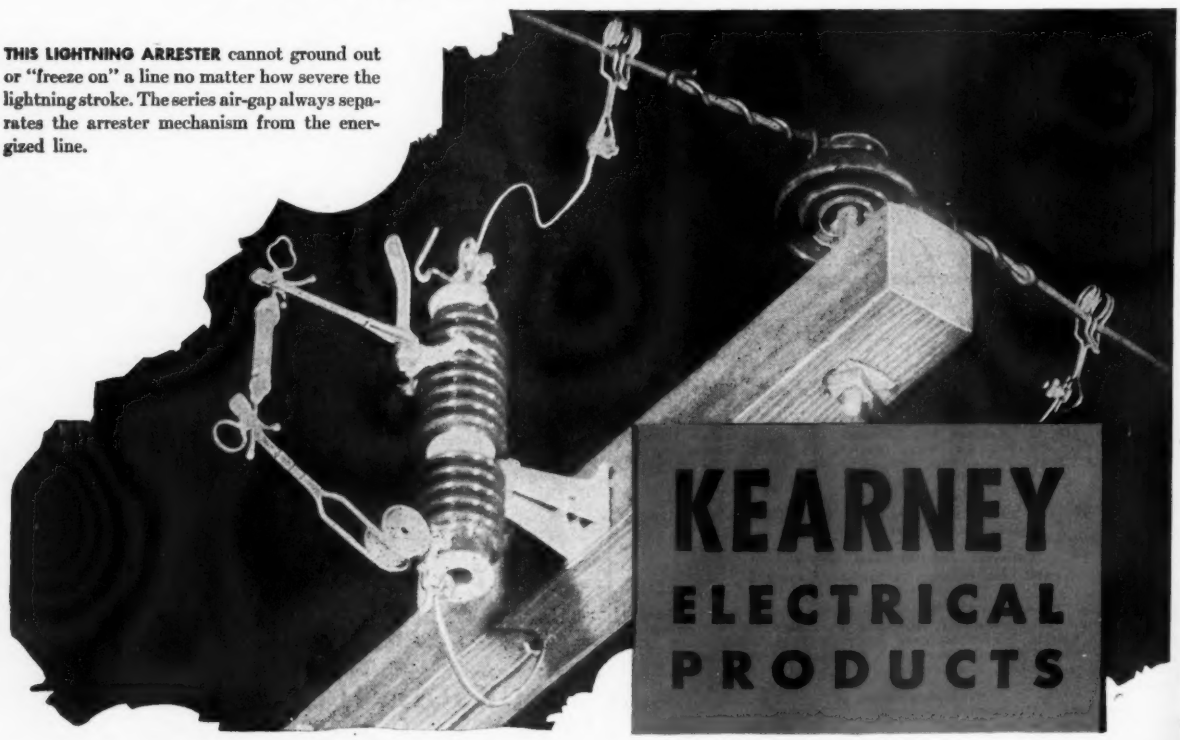
PRACTICAL—SERVICEABLE—DEPENDABLE

THIS LIGHTNING ARRESTER cannot ground out or "freeze on" a line no matter how severe the lightning stroke. The series air-gap always separates the arrester mechanism from the energized line.



KEARNEY
ELECTRICAL
PRODUCTS

Veteran Employment Plan For Electrical Industry

Industry's No. 2 problem is the reemployment of returning war veterans. In this article, the National Electrical Wholesalers' Assn. presents a plan for action.

MERCHANDISE DAY following the war period will have manpower as one of the industry's primary problems.

There will be a need for more men in the electrical industry, because of the increased volume of electrical appliance sales, and to keep pace with the high standard of living which has been developed as a result of the war industry effort.

There will be many reemployment efforts. Therefore, the electrical industry must be prepared at the proper moment to move into its own employment program, in order that it may secure its share of the better class of men and women who may be available. To delay is to run the risk of ending up with "run of the mill" employees.

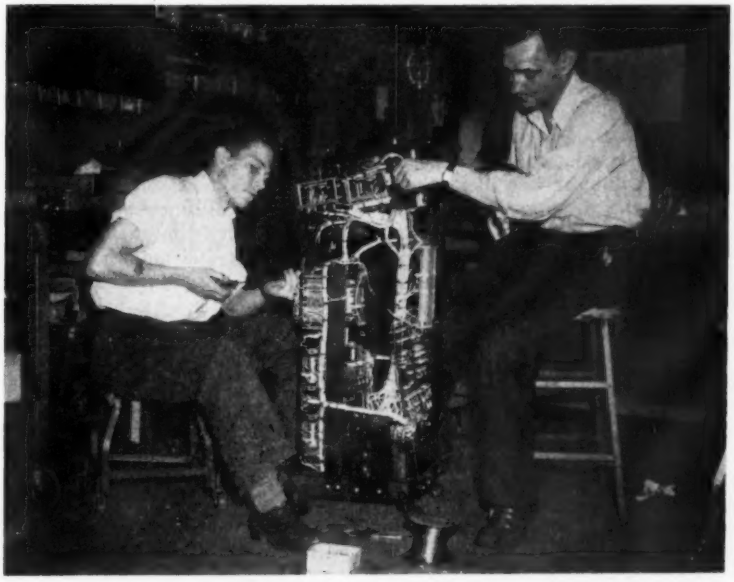
"Merchandise Day" will begin when? That is another section of the problem. Probably today is too early for a reemployment program, tomorrow may be too late, so it becomes evident that some middle course must be considered. While no firm wishes to load itself down at this stage of the game with unproductive employees, we must recognize that the electrical industry will be in direct competition for manpower with all other industries. Therefore, in order to meet this competition, the industry program must get off to an early start.

Certainly the least that can be done now is to prepare a complete and effective program which will be ready to be put into immediate operation when the time is right. The actual time of launching the industry's program can be determined when the factors involved in the decision can be more accurately analyzed.

Associations, manufacturers, wholesalers, contractors, utilities and retailers of electrical appliances, in fact all types of American industry and business are giving time now to formulating plans for the smooth, rapid assimilation of the returning veterans. In the main, these plans are national, emanating either at the industrial source and finding their way down to affiliated connections in the larger cities or they are plans conceived by trade, manufacturer, or civic associations throughout the country for general application within their own community.

It is the specific application to the electrical industry rather than a general application, with which we are concerned. It is our premise that plans now for the employment of veterans within the electrical industry will secure better employees for this industry; and by this personalized effort bring the industry up to par faster than if we are just part of a general, municipal or governmental plan.

We have the framework on which to build up interest for employment within the industry in the many stores, shops and offices which go to make up the electrica



Veterans of World War II are already finding their place in industry in spite of physical handicaps. After six and one-half months fighting on Guadalcanal, Clarence Plum, left, got a medical discharge and came home to help forge the weapons of victory. He is shown here with E. L. Roberts, a veteran of the North African campaign, working on an X-ray control in the X-ray division of Westinghouse, at Baltimore.

Fortunately for returning disabled veterans, industry has already learned to great extent that disabled men can still perform difficult tasks in a creditable manner. Here, Silky, a Seeing Eye dog, helps Harry Taylor Miller get to his war job on time. Mr. Miller, despite his handicap of blindness, uses a finely-dimensioned gauge to check the accuracy of polished, stainless steel steam turbine blade.

industry. By welding this employer strength into a personalized sustaining program, we will secure the first interest from those seeking new employment connections. Not only will we derive much bene fit ourselves, but we will create good public relations with the consuming public and be identified as part of the total national employment program.

There are four steps needed to make the suggested plan successful:

(1) We must develop local industry cooperation.

(2) We must create interest in the plan in the minds of those seeking new jobs.

(3) We must arrange for the equitable distribution throughout the electrical industry of applicants for employment.

(4) We should exchange information and data between local activities to bring about national results.

Local Industry Cooperation

To develop this cooperation it will be necessary that meetings for the principals of all establishments in the electrical industry be held. At these meetings all will be advised of the employment demand which the future will make on the industry. The plans for meeting these demands will be explained including how to pay the cost by means of a sustaining program. Such a sustaining program would be one in which the various branches of the electrical industry contribute a percentage of the estimated cost.

Inasmuch as this is an industry program and because all branches of the industry and the individuals or companies in each branch will benefit through the joint efforts, a registration fee is suggested for each establishment which agrees to participate in the plan. The total sum of registration fees and contributions will be used in the first phase of the program to get it started.

The amount derived from the registrations and contributions may be sufficient to continue the program beyond the initial period. It may, therefore, be necessary that a charge be made for each applicant who is accepted, after a 30-day trial, for employment by an establishment participating in the program

So far consideration of the framework on which to build the program and the cooperation in dollars which the industry must contribute have been dealt with. The next phase is the development of interest in the minds of those seeking new employment in the electrical industry.

It is estimated that once the German war has ended there will be 250,000 servicemen released each month, at least at the beginning of the discharge program. The industry will need men for all of its various divisions, such as appliance repairmen, salesmen, motor, elevator, and old burner repairmen, electricians, clerical and store helpers, power company personnel, etc. In order that we may acquire these services (civilians and veterans), we must plan to bring before them the many advantages to be found through employment in the electrical industry.

Plan of Action

It is suggested that the first phase to create interest might be the use of a display card in every possible electrical dealer shop, store, and office location; and wherever possible, in the USO, draft board, ration board, veteran's hospital, and personnel offices, etc., in the local area.

The display card will call attention to the advantage offered by the industry and suggest that those reading it ask for a booklet which will describe the opportunities within our field more fully. The booklet will be accompanied by a return postcard addressed to the local league or other clearing house. This brochure might include the electrical industry's war effort accomplishment; "Merchandise Day" and the opportunities in terms of expansion and new equipment will be clearly outlined. This brochure might very well contain pictures of stores and shops, scenes of actual electrical appliance repair, construction and maintenance work done by electricians and power company operators, etc.

In addition to the effectiveness of the display cards in industry windows and other locations, it will be necessary to distribute quantities of the booklets with the re-

(Continued on page 67)

Aggressive Appliance Promotion In Furniture Store Plans

By David Markstein

ELECTRIC appliances are expected to account for fifty per cent of his sales volume after the war, reports J. Hurwitz, president of Hurwitz-Mintz Furniture Co., in New Orleans. A furniture house where appliances were formerly no more than a profitable sideline, Hurwitz-Mintz will give the new appliance department preferred treatment after hostilities cease. It is expected to become a big money-maker.

"Appliances represented no more than thirty per cent of our volume before. But I'm laying plans now for a department that will bring at least half of the store's business," Mr. Hurwitz explains. "We'll sell all kinds of appliances, major and minor. Arrangement have already been made to handle the complete Norge line—and Norge has recently announced that it will manufacture many new postwar items that should sell well. Appliances like the new Norge cycle laundry, automatic clothes dryer, home and office unit coolers, home and farm package freezers, in addition to Norge's regular ranges, refrigerators, washing machines and heaters, should be the stuff to bring us tremendous volume.

"But major appliances aren't all we'll sell. I expect to have everything in the line of electrical merchandise, including radios, irons, toasters, waffle makers and anything new that comes out. Appliances will be our big push."

Plans Are Ready

Preparing for the day when they return for civilian use, Mr. Hurwitz has everything ready to go at a moment's notice. If new merchandise arrived tomorrow, in fact, he'd be ready to sell it the day after. Hurwitz-Mintz won't be caught unprepared when the big day comes.

Space inside the store's main entrance has been reserved for the new section when the time comes. "We'll hit 'em as soon as they enter," Hurwitz declares. "This location is ideal for a department as large as I expect the new appliances section to be. It gives, not maximum, but complete traffic—every customer must pass the department.

"Most of them will need something from it, for there isn't a family in New Orleans that doesn't want some kind of electrical merchandise. High traffic volume alone should be a good business builder."

Already Hurwitz has begun "wait and see" advertising. He wants New Orleans consumers to be as ready for reconversion as he is—and ready to think of Hurwitz-Mintz when they think of appliances. Sandwiched in with the store's furniture and stove advertisements are boxes plugging the new appliance department-to-be.

"Hurwitz-Mintz is planning for tomorrow," one such box headlines. "We are now planning for that great day when our floors will be filled with new Norge washers, ranges, electric refrigerators and other appliances," the copy explains. "Old customers, as well as new ones, will find that Hurwitz-Mintz will have something for them that will be worth waiting for."

Although advertisements of the Hurwitz-Mintz company advertise equipment now available, the copy includes an announcement (see arrow) of the full line of electrical appliances they expect to offer their customers after the war.

Such advertising will continue, on a small scale, until reconversion is really in sight. "Then when we see the daylight," Mr. Hurwitz says, "We're going to hit hard with appliance advertising. With it waiting until the merchandise is actually here, we'll begin plugging as soon as prospects look good.

"There is naturally no need to build up merchandise demand. What these ads will do is build up demand for Hurwitz-Mintz merchandise."

Detailed plans for selling the appliances when they arrive have also been made. Advertising will be our main selling tool," Mr. Hurwitz reports. "We're trying to reach hundreds of new customers who never bought here before. Direct mail selling to our account list won't do the job—although we probably will use that medium for reaching old customers.

"Lots of newspaper space is what I'm relying on to bring new faces into the store. It's the only medium that can reach so many prospects—when every homemaker is a prospect."

Hurwitz expects to junk the old appliance method of home selling. He will sell only on the floor, depending on his advertising to bring enough customers through the door.

Home selling has many disadvantages, he believes. First, it

is a real missionary selling job, appealing to those who do not want to buy—while floor selling, on the other hand, is in the nature of order taking, since prospective customers there have already demonstrated an interest by coming into the store.

His second objection concerns credit—or lack of it. A better class of trade—generally speaking—comes into the store, he declares. "We want no more credit headaches than necessary—home selling is looking for trouble.

"Newspaper advertising — on a large enough scale—can do the job of bringing in real prospects who won't be headaches."

He expects the big appliance demand to last three years, then level off, probably at a higher level than before the war. Multiplicity of new gadgets and better efficiency of old ones will be responsible for a normally greater demand.

"The first three years will be a picnic. Then we'll all settle down to a competitive appliance world again where we beg the customer to buy instead of the customer imploring us to sell."

Much will depend, Mr. Hurwitz expects, on the form of government control, or lack of it. Particularly in credit selling, he believes that what the government does will determine to a great extent the future of this business.

If present restrictions on down payments and length of time allowed to pay are removed, business will soar—and stay high. If not, appliance merchandising will be greatly complicated. With their comparative high prices, merchandising of major electric appliances needs a credit boost. But if the boost isn't big enough, it will do no good.

Even if controls remain, he believes that reduction of the required down payment to ten or twenty percent, and upping of the time allowed to eighteen or twenty months should do the job. Terms harder than that will be a great handicap to the whole appliance selling set-up, Hurwitz believes.

"Selling today is no standard by which to judge. If we asked 100% in cash, we'd get it. But after the war, money won't be as free or demand as great. We need credit help."

If the credit help materializes—and even if it doesn't—he's ready to do the greatest appliance selling job in his store's history. "Appliances, with automobiles, will enjoy the largest demand in history after V-Day," he says. "We're going to cash in on it."

Fluorescents for Printers Raises Over-All Efficiency

By O. D. Hall

PROPERLY placed fluorescent lighting has greatly increased illumination in the composing room of the Daily Oklahoman, at Oklahoma City, Okla., and has improved working efficiency there by at least one-third, according to Abe Towe, building manager for the Oklahoma Publishing Company.

In the 80 foot by 80 foot composing room, where the new lighting facilities were installed recently, some 100 skilled printers operate in shifts over a 24-hour day, six days in the week and part time on Sundays, to set the type and make up the pages for the Daily Oklahoman, The Oklahoma City Times, and the Oklahoma Farmer-Stockman. All three newspapers are under the management of the Oklahoma Publishing Company and have a wide circulation in Oklahoma and surrounding territory.

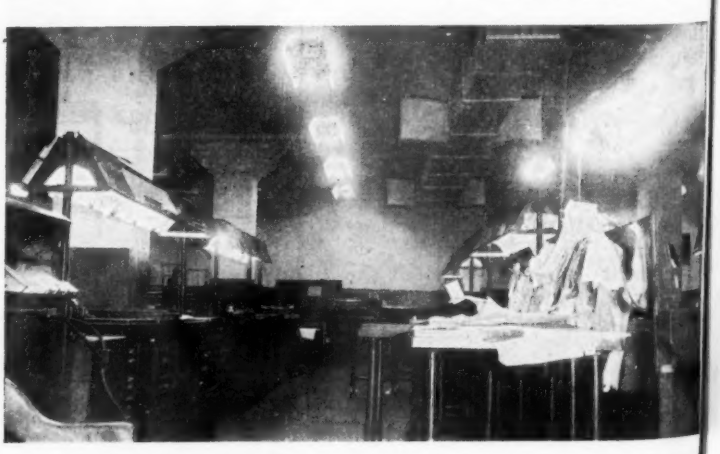
These men work under definitely more healthful, safer, and happier conditions than when the less modern lights were in operation. There is less absenteeism from minor illnesses, and complaints of eye strain have practically been eliminated, Mr. Towe states.

T. M. Richardson, sales representative of the Oklahoma Gas and Electric Co., Oklahoma City, who cooperated with the Carpenter Electric Co., in planning the installations and securing the necessary priorities, said:

"Results of my survey revealed that intensity of lighting under the old incandescent system ranged from only 5 to 10 foot-candles, which was considerably below standard recommended practice and was not conducive to efficient and safe working conditions. After the recommended change, which resulted in the installation of 75 five-foot industrial fluorescent units, the lighting intensity in all working areas was increased to 30 foot-candles. Workmen in this area reported that the effects from this lighting change were excellent.

"The change also resulted in a wattage decrease of 65 watts per outlet on 75 fixtures or a total decrease of 4,875 watts. This decreased wattage relieved the overloaded condition on all critical materials such as switches, branch circuit wiring, etc. The composing room was also equipped with

(*Continued on page 70*)



Three levels of fluorescent lighting in composing room of Oklahoma Publishing Company are shown here. The lamps, in metal hoods about three feet over tops of make-up tables and ad cases, are designed to give best lighting conditions for close work which requires high intensity.

PROTECTION OF ELECTRICAL WIRING

The subject of fuses versus circuit breakers for wiring protection has many angles. The editor will welcome discussions of this article for publication next month.

By J. L. Wagoner*

I SPEAK to you today as a representative of a group of circuit breaker manufacturers. But let me set you at ease at the very beginning of my discussion, I will not talk along technical lines nor will I dwell upon the intricate or controversial details of the relative merits of circuit breakers as opposed to other types of electrical protection. Although these details may have an important bearing on the final result, they are not of particular interest to you men whose chief responsibilities to the users of electricity is that of providing uninterrupted service and assuring safe adequate protection of electrical wiring against short circuits and dangerous over load conditions.

What is this protection of service and circuits which we must insure?

It varies, of course, in measure and degree, depending upon the type of application. I believe, therefore, it will be of greater interest to all of us to select the one class of electrical circuit which is most universally applied and with which you are most frequently concerned—the home electrical circuit—the 15 ampere circuit that almost invariably feeds the lights and motorized appliances.

What are the requirements for adequate protection of this class of electrical circuit? They are, after all, extremely simple—calling for the opening of the circuit within a predetermined amount of time before the load or current exceeds the safe capacity or load limit of that circuit.

Figure 1 shows this two-way requirement, with which you are all familiar.

Horizontally we measure current or amperes to a logarithmic scale—logarithmic to conserve space. Note that the first value represents 10 amperes, the next 15, then 30, the next 45, the next 100, and so on to 1,000 amperes. Horizontally, we measure current or amperes.

Vertically, and again by a logarithmic scale to conserve space, we measure time. First 1/100 of a second, second 1/10 of a second, next one second, next 10 seconds, and next in steps of minutes from 1 minute to 60 minutes or one hour at the top of our scale.

On this chart we can, therefore, plot the requirement for protection of an electrical circuit.

Now, back to that most universally used 15 ampere circuit, which, according to the specifications of the National Electrical Code, calls for No. 14 wire, which is rated at 15 amperes.

Figure 2 represents the time current characteristic of No. 14 rubber-covered wire based on a 30° C rise. The curve has been established by exhaustive tests conducted by the Underwriters Laboratories. Depending upon the amount of overload put through the wire, we see here the time in which a protective device must open the circuit.

This, then, is the No. 1 requirement of a 15 ampere circuit protective device protecting No. 14 wire.

But what about the millions of applications of No. 18 lamp cord that is universally used today? In

*Mr. Wagoner is manager of the Thermal Breaker Products for Westinghouse Electric & Mfg. Co. This article is based on an address before a group of meter engineers.

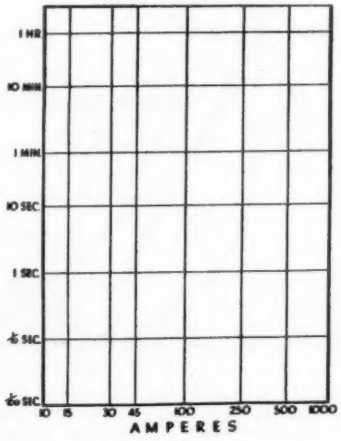


Fig. 1. Logarithmic coordinates for plotting time and current curves.

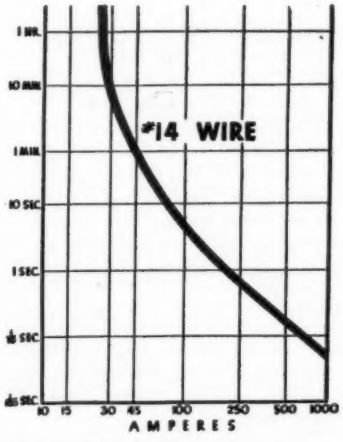


Fig. 2. Time-current curve for No. 14 rubber-covered wire, based on 30 degrees C rise.

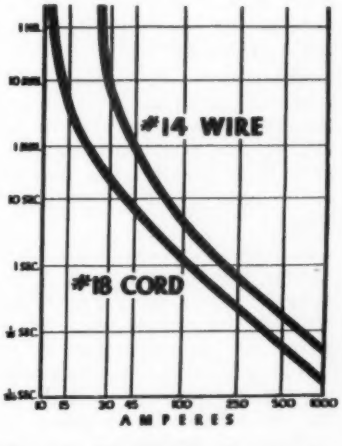


Fig. 3. Time-current curves for No. 14 rubber-covered wire and No. 18 lamp cord.

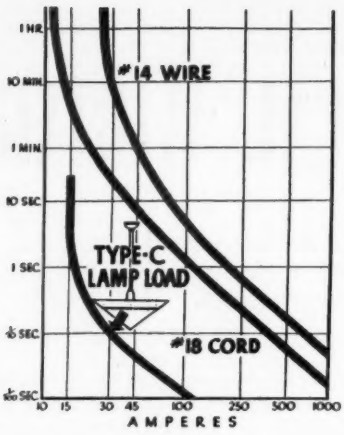


Fig. 4. Type C tungsten lamp draws 100 amperes for 1/100 second and requires several seconds to settle down to a normal 15 ampere load.

Figure 3, for No. 18 wire we see that protection must be provided still more quickly or we will have dangerous trouble with No. 18 wire because this wire is rated at only 6 amperes as against 15 amperes for No. 14 gauge. Furthermore, the time and current characteristics widely differ.

We might as well face the facts, and admit that a protective device designed to give 100 per cent protection to 15 ampere or No. 14 wire cannot and will not afford complete protection to 6 ampere or No. 18 wire.

We must not rob Peter to pay Paul, and our only alternative is to give as much protection to No. 18 wire as possible while still making certain that No. 14 wire will be fully protected.

Now there is another angle to this situation. What about time delay that is so essential for the satisfactory operation of other types of loads?

Many people have tried to ridicule the importance of time delay. But how many of them have ever stopped to consider the amount of current inrush when they turn on a bank of Type C tungsten lamps.

Suppose we have a 15 ampere circuit fully loaded with Type C tungsten lamps, see Figure 4. When we flip the switch, over 100 amperes are required for at least 1/100 of a second. It takes several seconds for the load to settle down to its normal 15 amperes.

Now this momentary overload is harmless. But just suppose a circuit protective device was not designed with a reasonable amount of time delay. What would happen? Obviously there would be a needless interruption of service.

But Type C lamps are not the only source of harmless momentary overloads. Think of the millions of motor-driven devices such as refrigerators, washers, ironers, furnace blowers and stokers. These devices also vitally affect the type of circuit protection needed. Figure 5 shows what happens.

Engineers have long been familiar with the starting characteristics of fractional horsepower rotors. But with the desire of supplementing this information, they recently made an intensive application study. Equipped with highly sensitive instruments they visited a number of modern homes and farms, making oscillograms of various motor-driven devices under every conceivable condition. From the data they secured it was possible to plot the band curve in Figure 5. This band curve, gives a picture of the protection zone which must be maintained to fully protect circuits feeding these motor-driven appliances and at the same time permit sufficient time delay so that undesirable and unnecessary interruptions cannot occur.

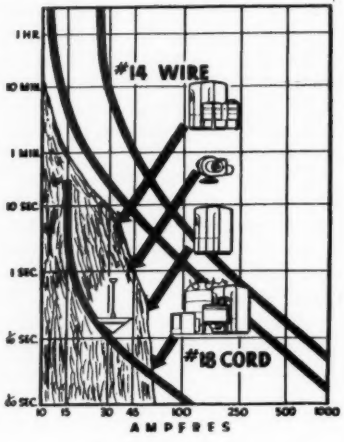


Fig. 5. Motor driven devices draw heavy instantaneous currents as shown by the shaded curve.

So now we have covered the three requirements of the standard 15 ampere circuit breaker protective device. Let us review these three requirements.

First, the device must completely protect No. 14 wire.

Second, it must provide as much protection as possible for No. 18 gauge.

And third, it must not open circuits during momentary and harmless overloads.

But there is a fourth requirement that has assumed commercial magnitude in the last few years. This is the requirement of fast, or I might say instantaneous operation. We do not say that this is right or wrong. On industrial motor circuits a certain amount of time delay is of major importance. But we do agree that on home and commercial lighting circuits there is no reason for permitting a short circuit to exist any longer than is necessary.

Therefore, it has long been our opinion that any breaker developed for such applications should provide for instantaneous operation on short circuits as well as permitting time delay for momentary safe overloads.

What is the difference between an overload and a short circuit? Where should this instantaneous operation start?

This may be a long debated subject, so why not let us say that any overload above the sum of the normal starting inrushes of the various loads of the circuit may for all practical purposes be considered a short circuit—because certainly there is no reason to provide time delay for a current above this value. Let us, therefore, say that instantaneous operation should start at about 150 amperes for a

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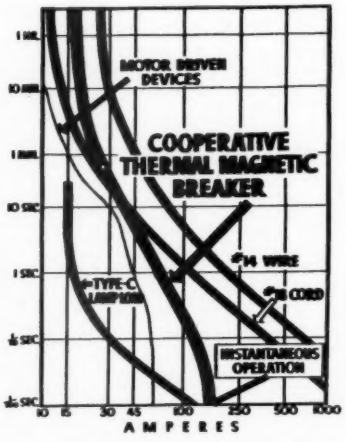


Fig. 6. The time-current characteristic of the cooperative thermal magnetic circuit breaker provides complete protection.

Maintaining Industrial Electrical Equipment

Part 2 – Drying and Reinsulating Motors*

MANY MOTORS are located where dust accumulates on windings and in ventilating ducts. Oily vapor and paper or textile dusts build up, and block off ventilation, leading to overheating of windings. Conducting dusts shorten creepage distances and penetrate windings, causing short circuits and grounds. Hard, sharp dusts abraid insulation, and shorten its useful life as they are driven past vulnerable surfaces by ventilation air. Cast-iron dust is a vicious enemy of insulation, because it is magnetic and is agitated by stray fields. Light, comparatively harmless dusts can be blown out with low-pressure, dry air. Grit, iron, dust, carbon, and copper dusts should be removed by suction. Hose tips for either pressure or suction should not be of metal.

Grease and oil can be removed by the conservative use of a solvent like carbon-tetrachloride, which evaporates quickly. After cleaning, dirt can be blown out. If dirt is excessive, this process must be repeated several times. Excessive applications of solvent will soak into inaccessible places, where it may soften and harm insulation. Vapor of the solvent mentioned does not present a fire or explosion hazard, but has toxic effects, therefore, making good ventilation essential wherever this solvent is used.

If motor windings require very frequent cleaning, consider substituting an enclosed motor, or take steps to keep dirt away from the motor.

Drying Windings

Motors in continuous operation will stay at a temperature sufficiently above room air to prevent condensation of moisture on and about the windings, even if the location is very steamy. Cold motors, however, accumulate moisture readily, which causes gradual deterioration of insulation. Where motors have to be idle for a long time, lamps or small space heaters should be installed, to keep the windings a few degrees higher than the surrounding temperature.

Dampness will be indicated by low insulation resistance. Deep penetration of dampness calls for special treatment. External heat can be applied under a canvas cover, well vented. Heating should not go beyond 90° C, as water must not be boiled in the insulation.

Current can be circulated through the windings by applying a low voltage to the windings. Current should be only a fraction of full-load current, and the temperature limitation of 90° C, should be observed. Resistance tests should be taken at intervals to note the trend. The motor can be put into load service somewhat below the recommended reading in megohms, because load heating will continue the drying-out process.

If the motor has been submerged for a long time, it must be carefully checked to see if rewinding is necessary. In the case of d-c machines, water between the commutator bars and the shell may be the source of low ground resistance instead of the windings. Rewinding is almost certain to be required sooner or later, if the motor has been "drowned" in salt water. After cleaning, some salt may remain, and if so, it will combine with moisture from the air. Totally enclosed motors, if idle in a damp place, should be examined periodically, as the insulation may gradually absorb moisture from the entrapped air. Presence of water in enclosed motors almost invariably indicates leakage at shield joints, handhole covers, lead entrances, etc. Such leakage may be avoided by use of sealing greases or compounds.

When testing a machine, a very careful record must be kept of the resistances of all the windings. For measuring the shunt-, commutating-, and series-field resistances, the voltage drop method may be used.

Reinsulating and Repacking

The best way to renew insulation and prolong its life is to use good varnishes. Two or more varnish treatments each followed by oven baking at a recommended temperature and time, usually will provide a strong, resistant coating. Manufacturer's instructions should be followed.

Before applying varnish, care must be taken to have the windings thoroughly clean and free from dust and dirt. While applying varnish, be careful not to block off ventilating ducts. Varnish that gets in between connections or on commutating surfaces should be cleaned off immediately before it sets. If a thorough varnish and baking treatment is not possible, various weak or damaged spots can be varnished with air-drying material.

In armature coils, any looseness of the coils in the slot will allow movement, chafing, and cause failure, as the windings are continually being acted upon by magnetic forces. On the other hand, coils slightly oversize, which require driving or excessive pressure when installing in the slots, may result in scoring, abrasion, and cracking of insulation.

Field coils used on synchronous and direct-current machinery, can sometimes be corrected for internal shorts by removing the entire field coil and heating it to approximately 100° C; dipping it in varnish while hot, allowing it to cool in the varnish; removing it from the varnish, and baking it again. It may be necessary to repeat this process several times in order to obtain a satisfactory repair job.

If, however, the field winding is wound directly on the pole, the coil should be left assembled on the pole, and both the coil and the pole treated as one unit.

*This article is adapted from information prepared by engineers of the General Electric Company.

Connection and Mechanical Work

Connections include places where copper is bolted to a brush-holder bracket, field connections (shunt and series), machine cables, and line connections. While a machine is being disassembled, leads should be tagged to save time and errors. Contact surfaces should be cleaned, scraped, filed, or polished, so as to provide good contact. Tighten all fastenings as alternate heating and cooling tends to loosen them.

Check connections according to instruction book, nameplate, or diagrams. Tape all connections that were taped originally, and restore them to their original condition.

Windings are subjected to many forces of various types; hence, if there are any loose fits, the windings may be damaged. Magnetic force may be very great, and certain machines have end windings bound to insulated supporting rings. Ring insulation should be checked whenever it is accessible. After overhauling windings, the ring binding should be replaced, using suitable cord applied with considerable tension.

Binding bands over rotating windings are made up in several ways, varying in different types of machines. Proper replacement calls for good workmanship, as a loosened band can do great damage. Removable, solid-strap bands, and removable-wire assemblies, require special clamps for their replacement. Wire-wound bands are made up new, as needed, by winding the wire on the part under high, controlled tension. The wires are then soldered together to make a solid band.

The choice of slot-wedge material depends upon the type of slot, size and rating of the machine, and service conditions. In small machines with partially closed slots, selected maple wood is more generally used, although formed fiber wedges are required where space is limited. Textolite wedges are used where service conditions are severe, as in Class B insulated machines.

Care should be taken in installing wedges to see that there is no room for free play of windings up and down in the slots. Fill any loose space with slot fillers of material recommended by the manufacturer. Also, see that insulation is not bruised or scarred by the retainers.

Spools of field coils should be tight on the poles. In reassembling, it is necessary to make sure that separate pieces are all in their proper places.

Collector Rings

Collector rings on synchronous machines carry only d-c excitation current. The rings on wound-rotor motors carry heavy alternating current during starting and acceleration and during reduced-speed operation. On some direct-current machines for 3-wire distribution of power, there are rings as well as a commutator. These rings are usually of bronze or some other nonferrous metal, and require special care when being turned.

Insulation resistance, ring to shaft, and studs (or leads) to rings, should be checked at reasonable intervals to detect cracked or otherwise defective bushings and collars. Resistance and creepage space may have been reduced by an accumulation of brush carbon and metal dust from the rings. Thorough cleaning is frequently required.

Suitable stiff brushes can be used to remove the major part of the accumulation. Washing with carbon tetrachloride, using a cloth or paint brush, should follow. Dirt from external sources may indicate the need for a cover over the rings. Rings should not be enclosed unless designed for an enclosure.

End play and brush staggering should prevent wearing of grooves in the rings, or the formation of ridges along the edges. The wearing surface of the rings should be bright and smooth. Under normal conditions, the surface will require little care.

When the rings have worn excessively eccentric with the shaft, the ring faces should be machined. This can be done in a lathe or on the machine by using a portable tool. After turning, the tool marks should be dressed out so that a fair polish is attained. If new rings are required, they should be obtained from the original manufacturer.

Armature and Stator Coil Terms and Definitions

By A. C. Roe

IN THE fabrication of armature and stator coils used in electrical apparatus there are a number of terms used, that are not widely known and understood. In the interests of accuracy and correct usage, the more important terms will be defined in this series of articles.

Part I.

Bar is the term applied to a piece of metal or other material, long in proportion to its breadth or thickness, and of any cross-sectional shape, that is received at the point of application in bare, straight lengths; that is, not coiled. It usually possesses considerable rigidity.

Conductor is considered one or more single strands adjacent to one another and electrically in parallel. A conductor may be composed of a large, solid strand or be broken up into a number of smaller strands in parallel, similar to flexible cable; the complete cable in this case is the conductor and each individual small wire is the strand. For example, a cable designated, "49 of 0.0251" means a conductor composed of 49 strands, each 0.0251" in diameter. The relation between a strand and a conductor is shown in Fig. 1.

Conductors are stranded to secure flexibility and reduction of eddy currents.

Ribbon is any conductor of rectangular cross-section, rigid about one axis, received at the place of application in long lengths, coiled, or on reels, insulated.

Strand is any single bar, wire, ribbon, strap, or sheet, capable of carrying current.

Strap is any strand or conductor of rectangular cross-section received at the point of application in long lengths, coiled, or on reels, bare. "Copper strap" is the term used for this material when

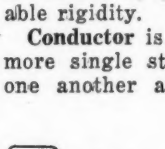


Fig. 1

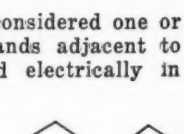


Fig. 2

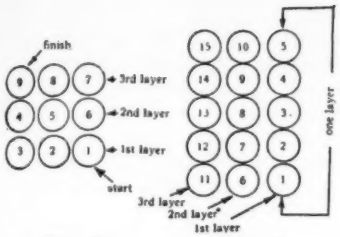


Fig. 3 Fig. 4

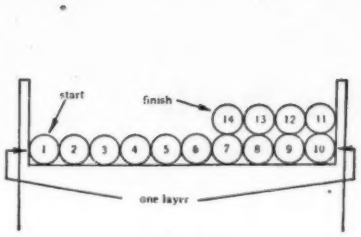


Fig. 5

writing coil specifications.

Wire is any conductor of round or square cross-section received at the point of application, coiled or on reels, insulated. It usually has appreciable flexibility.

Turn is one conductor making one complete loop electrically, around a magnetic circuit. Fig. 2.

Layers are consecutive electrical turns lying side by side in one plane. Fig. 3 shows a nine-turn coil of three layers, three turns per layer, with the turns wound in the sequence as numbered. Fig. 4 shows a 15-turn, 3-layer coil, having 5 turns per layer. Figs. 3 and 4 are types often found in armature and stator coils. Fig. 5 shows a coil having 10 turns per layer. This arrangement is found in field, magnet, and transformer coils. In these figures, the turns are numbered in their electrical sequence, and also in the sequence of mechanical application.

Cross-over is the term used to indicate a change from one layer to the next in electrical sequence.

Coil is a group of conductors formed into a mechanical unit ready for assembly into a complete winding, as shown in Fig. 6.

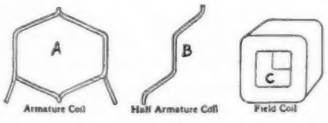


Fig. 6

This unit may consist of one or more turns, layers, or single coils. In general, all of the conductors making up the unit are assembled and insulated together. A coil, however, may consist of a number of separately-insulated sections which, in winding, are placed side by side in the same slot.

Armature coil is the term generally used to indicate coils for direct-current armatures.

Bottom of coil is that part of each coil half farthest from the air gap.

Coil pitch is the distance between two sides of a coil, measured in elements. In a full-pitch winding, the coil pitch equals the distance in elements between centers of adjacent poles. In a fractional-pitch or chorded winding, the coil pitch is either less or greater than the distance between the centers of adjacent poles.

Back pitch is the same as the coil pitch. It is the distance between the two sides of a coil measured in coil sides or elements at the back of the armature. It is represented as Y_1 in Figs. 7 and 8.

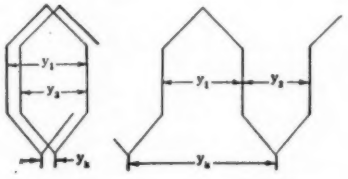


Fig. 7 Fig. 8

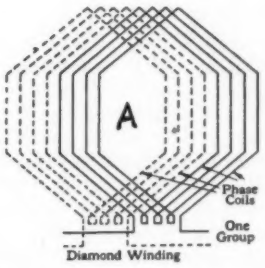
Commutator pitch is the distance between the two commutator bars connected to the ends of a coil, measured in commutator bars. It is equal to the algebraic sum of the front and back pitches. In Figs. 7 and 8, it is represented as $K=y_1-y_2$.

Front pitch is the distance between the two coil sides connected to the same commutator bar, measured in coil sides or elements at the front or commutator end of the armature. It is shown as Y_2 in Figs. 7 and 8.

Concentric coil is one of a group of similarly-shaped, but varying-sized coils, having a common center. See Figs. 9-B and 10.

Crossed coil is one in which the last turn is more than a full turn, so that the finishing lead overlaps the starting lead as in Fig. 11.

Diamond coil is one whose ends, if the slot portions were eliminated, would form a diamond shape. It has an offset at each end so that little or no forming need be done when the coils are wound into a machine. This offset may be obtained either by winding into a mold having the proper shape, or by "pulling." The turns may be wound either promiscuously as in most "threaded-in" type coils, or in layers as in most open-slot type coils.



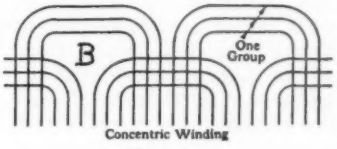


Fig. 9

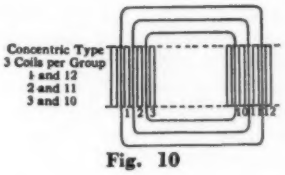


Fig. 10

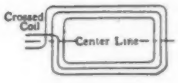


Fig. 11

Double loop coil indicates that a special cross-over loop has been made at the rear or front diamond point, so that the top lead is brought off from the top of the coil, and the bottom lead from the bottom of the coil.

Field coil denotes the coils used to energize the magnetic circuit of generators or synchronous motors. These coils are generally of rectangular shape.

Formed coils is a term indicating that the wire is cut to predetermined lengths and then formed around a special former to final shape.

Group of coils comprises all adjacent coils of the same circuit. In alternating-current rotating machinery, it comprises the number of coils per pole per phase, as shown in Fig. 9, and hence is called a "pole-phase" group.

(Part 2 of this series will appear in the December issue.)

Substantial Business Built On Value-at-a-Profit Policy

By Chas. N. Tunnell

THE AVERAGE BUYER of electrical work wants good workmanship, good merchandise—and he wants to know all the facts of the case. He doesn't want any cheap substitutes for standard devices and skilled workmanship, and this applies to the general contractor, the property owner, the big industrial plant owner, who wants electrical extensions or supplemental work, or to any other person interested in paying for the services of an electrical contractor.

This is how H. J. Pfeiffer sizes up the situation in the electrical contracting field. His policy is pretty much responsible for the fact that only three jobs in 1944 have been obtained on a competitive basis—the others have been a matter of doing business with people who have had Pfeiffer work before or who have been told by business associates that the Pfeiffer brothers not only know the electrical contracting field, but do the job right, stick to their word, and don't rob the client.

H. J. Pfeiffer and his brother, A. W. Pfeiffer, are the owners of the Pfeiffer Electric Company, in La Porte, Texas. These two brothers make an ideal working combination—A. W. is the inside man, handling office, some of the purchasing, plans, etc., and H. J. is the outside man who is on the jobs, making purchases, contacting the contractors and business executives and numerous other things that rounds out into a work day of almost 18 hours instead of the usual 8-hour day.

Had Humble Start

The Pfeiffers are go-getters. They just believe that every job must stand on its own and that their professional reputation hangs on every job. These boys came up the electrical route — their father built the first light plant in La Porte in 1912. This was a small bayshore town some 20 miles from Houston. In 1920, the light plant burned, pretty well wrecking the family nest egg; so H. J. Pfeiffer came to Houston and started carrying tools as a journeyman electrician. The following year he helped A. W., his brother, set up a small electrical business in La Porte.

H. J. continued working as an electrician in Houston until 1930; the depression caused him to lose his job. He joined his brother in operating the small shop. It was a small business, but by 1933, the Pfeiffers began to move along and expand. H. J. was out hustling up the jobs, not only around La Porte, but along the fringes of Houston, Galveston, Texas City and other cities. This small town contractor was building a reputation for good dependable work. Several general contractors began passing along some work that wasn't on a competitive basis even in this depression period when electricians and sub-contractors were going mighty low to get work.

In 1938, the Pfeiffers had built a solid business, so much so that they obtained a Houston license and soon opened a Houston office and warehouse. Soon these contractors were doing a big business in Houston, though the main office and the homes of these brothers remained in La Porte.

The Pfeiffer Electric Company has done a lot of war projects, getting its share of this war plant business from the first. Now with the war shaping up and most new building for this purpose finished, electrical contractors have begun to cast about for other fields.

On this subject, H. J. Pfeiffer says, "The out-and-out war plant projects are about all finished, but so many of these plants will become postwar permanent industries that most contractors will be kept busy for several years to come.

"We have already noticed some change for the better in the number of electricians that are available and certainly in the class of mechanics. We are getting better workmen and better production. And although some of our present jobs and big accounts are directly tied up with war work, we are continuing work and hope to keep up certain supplemental work for many months.

"For example, we did not do the electrical contract for the General Tire and Rubber Company plant at Baytown, but we have done $15,000 of supplemental work there recently, and industrial plants like this one are permanent improvements for the South. We are now doing the entire electrical job on the A. O. Smith job, the line work on the Sheffield Steel of Texas Company plant, the work on the Texas Electric Casting plant, and supplemental work at the Abercrombie-Harris plant, the Galveston Ferry Landing for the Texas Highway Department, a U. S. Engineers warehouse in Galveston, and continuation of electrical contracts for the Southport Petroleum Refinery, at Texas City. Work on this latter contract was started in January, 1943.

Supplemental Contracts Profitable

"Though we didn't do the original, we have done $75,000 in supplemental contracts for the Todd Shipyards, at Galveston, since January 1, 1944. Some of the war projects that we have finished or have under way are the Cuney Housing Project in Houston and the San Felipe Housing job, the latter still in progress. This job started as a re-settlement project and was converted into a war housing project during the progress of the war with additional units still being constructed."

The Pfeiffer brothers have other jobs to their credit of a different nature, since the war began, such as the Y. W. C. A. building in Houston, several new Interstate theaters in Houston, and the remodeling of the Majestic, the largest unit of this theater chain. The Pfeiffers do the new and remodeling work for these theater people just as they do the electrical work for various other commercial firms that require new or enlarged buildings.

"The material situation is improving some, labor is improving, and for the local contractor, who is sincerely interested in his clients and their needs, the future is bright for several years to come," says H. J. Pfeiffer. "It may be some months yet before individual home building will be possible, but the domestic field will be a big one for several years, and this time, the contractor with a reputation for good work and fair dealings will profit. Prospective home owners are going to be careful builders—they have seen enough of these cheap war homes."

A DIGEST OF SUCCESSFUL SELLING IDEAS

THE SELLING PARADE (REGISTERED)

BY CHARLES B. ROTH

Five Ways to Win Today

NATURALLY, every salesman in America these days is thinking hard about how to meet the changing conditions which will come immediately after the war. Our whole world will be different. Economists say that for a while it will be easier. Then it will became harder.

It's to meet those harder days that wise salesmen are preparing themselves today.

But one wise sales executive says that no matter what conditions may be they will be duck soup for the salesman who masters what he terms the "Five F's."

As a matter of fact, right now he's woodshedding his men in those "Five F's" building his sales around them, getting his men to think, think, think in their terms.

The other day when I talked to him I asked him to explain his secret system.

"Oh, it's no secret at all," said he. "I didn't originate it. I borrowed it. I borrowed it from the work of a man I admired very much."

"A business man?"

"No, of all things, a college president."

"Who was he?"

"Dr. Glenn Frank."

"He was one of the wisest Americans of his day," I observed.

"That's what I think too," responded the sales executive. "So when I read, years ago, his views on facts and their treatment, I saw they fit immediately and immensely into the problem every salesman faces today."

"Will you give me your 'Five-F's'?"

"They are very simple. First, according to Dr. Frank, you have to FIND THE FACTS."

"That means research, digging, investigation," I said.

"Right. Then you have to FILTER THE FACTS. Next you have to FOCUS THE FACTS so that they apply clearly to your job or need. And then," and he smiled, "comes the hardest of all. You have to FACE THE FACTS. Most of us fall down here—we don't face the facts."

"I know that."

"And, finally, all you have to do is FOLLOW THE FACTS. And any salesman who will do these simple things can't miss, no matter what our postwar world is like."

I said I didn't see how he could either.

Market Analysis Down to Earth

A few years ago when we went through a spree of luxury and hired college professors and "brain trusters" for high places (it was very expensive, as most sprees are), market research was a term that catapulted to popularity.

Market analysis and research were supposed to be the all in all for any business man with difficulty. That analysis and research are good there's no doubt. Every business man has to have them. So does every salesman.

But all he needs is the simplest kind, based upon the hard rock of good old-fashioned commonsense.

Edgar Kobak, big radio executive, believes this statement of mine, too, and he was telling me some time ago about the most skilled job of selling he had ever seen. It was based upon intelligent market analysis, Kobak says.

He drove his car into the Cadillac station for some work when a Negro boy accosted him.

"I'se out of work, boss. I can chauffeur. Do you need a good chauffeur?"

"That complimented me," Kobak says. "So I questioned him. Why did he come to the Cadillac station? I wanted to know. That was the first step in his market analysis. He went to the logical place for business. He figured that if anybody could drive a Cad. he could afford to pay a chauffeur's wage.

"Then with beautiful directness he asked for an order. 'Do you need a good chauffeur?' No beating around the bush. No backtracking. No bushwhacking. Just perfect simplicity and directness.

"When he left he shoved a card into my hand. It read:

COLORED
Wishes a Position with Private Family
Chauffeur or Porter
Experience A-1—Best References
Call Any Time After 6 P.M.
16 years with Pullman.

"That card was the final master stroke. It prevented me from forgetting him—it was a continuing sales talk. Note the wording. Just as direct as his sales talk.

"Next day I called a friend of mine who needed a chauffeur, told him of this Negro. He was interested. So I telephoned the number on the card. A cheerful woman's voice responded: "'Oh, he's done gone to work. He got him a good job last night.'"

You Have to Love 'em

One selling story I have seen reprinted ever so many times of late is so good I am going to reprint it again. Author is William Stidger, who writes a column on getting the most out of life for the Chicago Daily News. I am not sure, but I think Mr. Stidger is a minister. This story is something, however, salesmen should read.

A wealthy man was looking for a mate for a beautiful ruby he owned. A salesman in a dealer's shop met him courteously, showed him an exquisite gem, placing it on a white plush pad for observation.

"There your are, sir," said the salesman. "This stone is practically identical with yours in size, color and depth. The price is $5,000."

Then the prospect looked at the salesman's face. No enthusiasm there. No glow. No affection for the job he was doing.

"I don't think I will take it," he said and started to leave.

The owner of the shop met him before he left and said, "I hope you will pardon me, but I wonder if I might show you that ruby again?"

That seemed a reasonable request.

This time the proprietor held the sparkling gem protectingly in his hand. What he said about it was not important. But his words expressed a compelling affection which found a response in the mind and heart of the customer.

The prospect bought.

"Why is it," he asked, "that I bought this stone from you so willingly and eagerly, yet I would not buy it from your salesman?"

"My salesman is one of the best men in the business," said the proprietor. "I pay him a large salary for he is an expert in stones. Yet if I could take something from my own heart and implant it in his I would gladly pay him twice his present salary. That salesman KNOWS precious stones —but I LOVE them."

When They Say They'll Let You Know

There's no telling how many good salesmen have been thrown for a loss by the prospect who says, "Swell. I like what you tell me, and your price is right. I'll let you know about it later."

Maybe he will.

Chances are he won't.

Maybe he was sincere in telling you that.

Chances are it's just a stall.

A fine salesman working out of Chicago has a way of handling that kind of talk.

When he hears it he smiles. Then when the customer is wondering what he will say next this is what he says:

"I'm glad you will let me know later, and I want you to think it over as long as you want. You know, when I was new in this business and a prospect told me that, I thought it was just a polite way of saying, 'No.'

"But as my experience grew, I found that most of the folks who said that really meant it—and they made the best kind of customers, because they were more careful in their business dealings.

"So when you said, 'I'll let you know, later' to me just now, you made me more anxious than ever to get you on our books because we like to do business with careful buyers.

"I don't want to be a bore or seem too persistent—but if you will give a few more minutes of your time, I believe we can get you started on this plan now, without your having to wait or bother about letting me know later."

He finds that that smiling persistence, plus a dash of flattery, is the easiest way to get the man who can't make up his mind till later to make it up now.

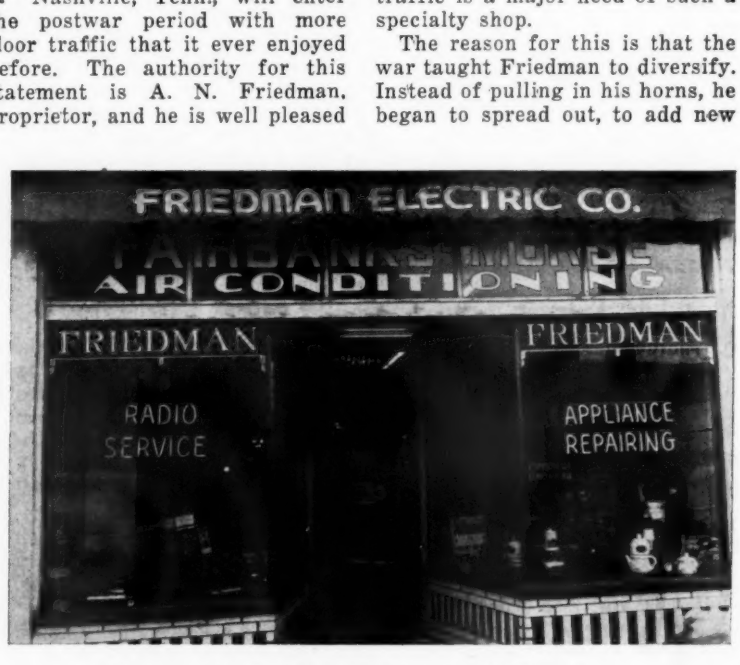
Why don't you try this technique on some of your customers? Chances are it will work as well for you.

Floor Traffic Value Learned From Wartime Conditions

By Geo. H. Watson

FRIEDMAN Electric Company, Nashville, Tenn., will enter the postwar period with more floor traffic that it ever enjoyed before. The authority for this statement is A. N. Friedman, proprietor, and he is well pleased with the prospects because floor traffic is a major need of such a specialty shop.

The reason for this is that the war taught Friedman to diversify. Instead of pulling in his horns, he began to spread out, to add new



Exterior of the Friedman display rooms in Nashville.

lines and broaden the services already extended. In the days before Pearl Harbor, he sold as many major appliances as any other dealer in his territory. He managed to keep enough reconditioned radios, refrigerators, washers and ranges to make a fairly good display even up to now. In this way, he retained an appliance store appearance for his establishment.

In addition he began early to expand his service department which has really proved the backbone of his business. He also continued his electric wiring department which has handled some good size war contracts. He added considerable other merchandise in the variety store and hardware field, items which sell across the counter. On top of that, he became headquarters for various types of fluorescent lighting.

"The way looked rather tough at one time," said Mr. Friedman, "but I had been in business for 19 years at the same stand, going through wars, depression and booms and I was determined that now was no time to quit. I bought anything, almost, including paint, glassware and art goods that I could sell at a profit. I admit some of this was more or less for window dressing, to give us that busy look, and I may or may not carry it when appliances become more plentiful once again.

"As new merchandise in the appliance field played out, the repair business began to pick up. At times for the lack of help, I even carried tools myself and worked at the radio bench. I had not done that in years. Then I began to build up my organization to take care of this increase, using boys and older men as repairmen, and girls as sales persons on the floor.

"We now have the largest organization we ever had, more floor traffic, and just about as large volume of business. We feel we have a better balanced business, one which I believe is war and depression proof.

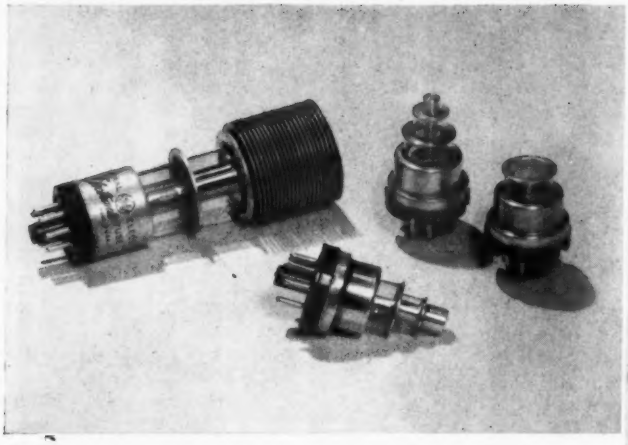
Full Line Planned for Postwar

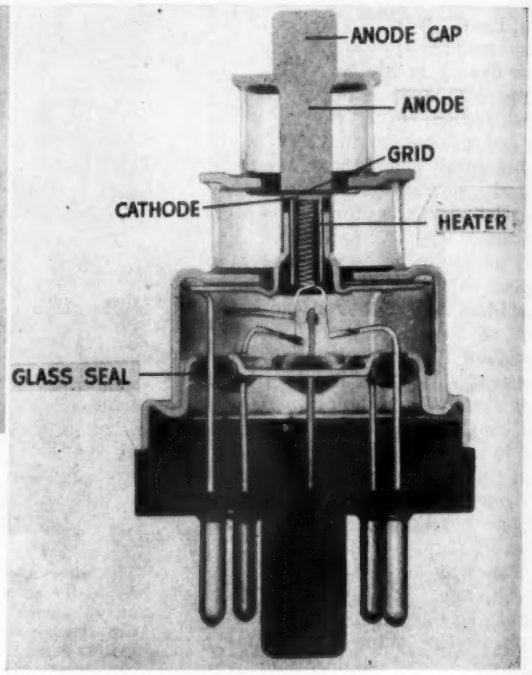
"In the postwar period we will sell everything electric and service everything electrical. That covers a broader field than most dealers might think—in fact, show me a mechanical contrivance today that isn't electrical? Right now we fix such items as radios, ventilating fans, vacuum cleaners, electric clocks, electric shavers, home air conditioners and refrigerators in our shop.

"We may be considered old timers in the business, but as we view it, our opportunity will only begin with the end of the war. We expect in one year to be selling FM radios, and in 5 years, television sets. In the refrigeration field, we see a big business in home freezers and home air conditioners. For the farm we will sell all kinds of electric appliances, including pumps, milk coolers and electric brooders. We sold some electric kitchens in the past, but we will sell more in the future including built in garbage disposal units, dish washers and food choppers. We will also sell complete home laundries including water heater, automatic washer, drier and ironer. Some people thing we are already in the electric era, but I say we are just entering it.

(*Continued on page 66*)

The view above of the Friedman Electric Company's display rooms in Nashville show some of the "merchandise tables" that have been used advantageously to stimulate store traffic. At the rear of the store are the fixture displays and the small appliance repair department shown below. Note that manpower problems in the repair department have been solved by using an older man and a young boy.





Above, examples of the new "lighthouse" tubes. The largest is a transmitter tube; the others for receivers. Cut-away at right shows internal construction details.

Revolutionary Tubes For Postwar Radio

A REVOLUTIONARY disk-seal electronic tube, widely known among radio engineers in the military services as the "lighthouse tube," will provide the basis for a multitude of new public services in the FM radio, television, and other electronic fields after the war. The new tube has given the Allies a decided edge over the Axis in the military radio field.

Existence of the new tube was acknowledged publicly early in April when the military services allowed General Electric to disclose that tubes are available to make possible radio relaying of television and FM radio programs postwar. But beyond that, no further information could be revealed.

The invention of the revolutionary tube (megatron is the generic name assigned to tubes of this design) advances by far the frequencies and power available for use in the electronics field. It has made possible a large new family of ultra-high frequency electronic tubes, circuits, and apparatus which now operate in parts of the spectrum impractical of use before the war. The area of practical tube application has been increased many times by the invention.

(The military services will not allow release of specific information on the increase nor details on circuits or apparatus in which the tubes are used.)

To convey the importance of this achievement, for example, the invention will permit production of efficient FM radio and television relay systems which will help make possible quick postwar expansion of those services. It will make possible for the first time the production of medium and high-power television transmitters which will be able to operate in the very high frequency bands. It will provide room for the expansion of radio navigational aids of all kinds; directional and ranging devices applicable to mobile services; numerous medical and industrial applications of electronics, and a host of other "yet to be developed" electronic products.

The new tube eliminates the conventional type of grid, anode and cathode. Instead of components being fitted around one another as in the past, they are now constructed in simple, parallel planes or layers, with glass and metal fused together in rigid, inseparable units that are strong and capable of withstanding severe jolts. This design permits an extremely compact over-all tube structure, while providing high frequency and high power output. It gives uniform co-planar electrode design, very low plate-to-cathode interelectrode capacitance, and very high permanence of characteristics.

Hitherto, as engineers progressed up the scale of the radio spectrum to the higher frequencies, it became more difficult to produce electronic tubes and apparatus having adequate power to perform the desired service. As frequencies became higher and wavelengths shorter, the electronic tubes to produce the radio signals by necessity became smaller, and their ability to produce adequate amounts of radio power became less. And so the medium and high frequency portions of the radio spectrum became crowded. The parallel plane construction in the new tube makes possible the production of the higher frequencies at sufficient power, and also makes available many high and ultra-high frequencies from which one may be selected for a particular service and used without interference from others.

General Electric's development was made available to Allied private and government research and engineering groups. The Naval Research Laboratory and the Camp Evans Signal Laboratory of the Army were among the government groups which actively engaged in the early applications of the new development.

Southern Electrical Inspectors Make Postwar Code Plans

ALTHOUGH wartime travel restrictions limited attendance to less than 200, the Southern Section, International Association of Electrical Inspectors, held a most successful annual meeting in Atlanta, on September 25, 26 and 27.

At the opening session, International President, James D. Lynett, New York City, discussed plans for the revision of the National Electrical Code. He pointed out that the chairman and members of Article Committees and of Technical Sub-Committees are to submit their reports to the Electrical Committee on or before December 15, 1944, and that the Electrical Committee plans to meet in Chicago in May, 1945, to consider revisions for the new edition of the Code. The 1945 edition, he said, will probably be issued late in the year.

Mr. Lynett expressed the hope that by the time the new code appeared, the war would be over, and that the industry would be able to enforce the rules with regard to materials. He stated that the so-called minimum requirements were further reduced during the war and that these wartime standards should be eliminated as quickly as possible.

Dewey L. Johnson, president of the Southern Section, also addressed the opening session, emphasizing that the discussions before the Southern Section, for the most part, related to the postwar edition of the National Electrical Code. He said that the public must be re-educated to good standards as soon as conditions would allow, but he anticipated some difficulty in accomplishing this.

Victor H. Tousley, International Secretary for the IAEI, directed attention to the fact that the Association has over 200,000 copies of the publication entitled "Safety in War Times" available for distribution and suggested that the various inspection departments distribute these throughout schools during fire prevention week.

The Section next received a report from the chairman of the Membership Committee, James Steel Mahan. Mr. Mahan stated that the IAEI now lacked only 720 members in achieving the 5,000 mark set as a goal. The quota for the Southern Section is 179. He pointed out that the IAEI has a class of membership for everyone in the electrical industry and that all branches of the industry should be interested in the work of this Association.

The first session of the meeting was concluded with reports from the various chapters that comprise the Southern Section. The North Division of the Louisiana Chapter has made application for organization as a new chapter to be known as the North Louisiana-East Texas Chapter.

At the Monday afternoon session, the members of the Southern Section heard a report on postwar suggestions from George Welman, of New Orleans. Mr. Welman urged the chapters to hold more meetings and said that the South-

Members of the Southern Section, IAEI, assembled in Atlanta for their 16th annual conference.

ern Section has never had successful reports from the Article Committees as a whole and recommended that in the future more attention be given to these appointments. He criticized those members of Article Committees who do not answer their correspondence promptly and warned that unless the inspectors take a more active part, they are not going to get an adequate safety code.

"Tips to Electrical Inspectors" was the subject of a talk by E. C. Knox, of Miami. Mr. Knox said there were no books on how to be an electrical inspector and that this field was further complicated by the fact that some very good men are let out of jobs for purely political reasons. He gave a few qualifications of a good electrical inspector. First, he must select this as a life-time occupation; second, he must be able to get along with people; third, he must be honest in his decisions; and, last, he must keep up with the advancement of the trade. He felt that most people want good inspections. Plans should be first approved by the inspector before the job is begun. This gives him a chance to bring in recommendations for safety and adequacy. Inspectors should investigate all electrical fires and try to get rules in the Code to prevent a recurrence. His job is to educate the contractor and journeyman.

D. L. Beeman, of Schenectady, presented a moving picture on industrial network systems which brought about considerable discussion relating to dead front type of equipment and related equipment.

Self-Sustaining IAEI Needed

Marion H. Hedges, director of research, for the International Brotherhood of Electrical Workers, Washington, D. C., followed Mr. Beeman on the program. He outlined some of the plans that are being carried out on postwar education and adjustment of electrical workers and in discussing the close relations and interest of his organization and IAEI, he expressed the belief that the IAEI should be self-sustaining and should discontinue accepting finances from manufacturers. He also raised the question as to whether or not the usefulness of the Association could be increased by reorganizing the Electrical Committee.

The remainder of the Tuesday sessions was devoted to discussions of the proposed code revisions submitted by Article Committees.

Infra-Red Equipment

The Wednesday morning session opened with a report from Harvey Pye, of Atlanta, on the "Code Treatment of Infra-Red Drying Equipment." Mr. Pye stated that one of the most popular methods of wiring these lamps included the use of No. 12 conductors with No. 6 or 8 sub-feeders. Five lamps are generally placed in series on 440 volts, he said, with a load of approximately 10 amperes per circuit. The wiring method generally used is conduit with type A or A1 insulated conductors.

There is no infra-red equipment at present that would be suitable for installations in hazardous locations, according to Mr. Pye. A fire occurred in March, 1944, when lamps were located in a hazardous location. In this case, the lamps were used to dry the painted surfaces of metal radiators. The paint used had a flash point of 65°F. The radiators were sprayed with the paint and were allowed to remain on a conveyor to partially dry. When the radiators passed into the oven the heat from the lamps caused the paint to start dripping and this created an explosive atmosphere in the oven. One of the lamps was broken in the oven causing the fire. It is important that the lamps be protected from injury from objects passing through the oven on the conveyors.

Next of the program was a report from the "Postwar Committee on Inadequate Instalations," presented by E. C. Knox, of Miami. He pointed out that a large percentage of the factories now working on war materials may go over to the manufacturer of electrical equipment after the war ends. He said that the high efficiency of lighting used in the war plants will soon find its way into the homes of these war workers. It is understood that approximately 85,000 new homes will be built within a five-year period after the war and that the sale of new appliances and equipment will require additional wiring to take care of the added load.

An interesting paper on the code treatment of electric welding was presented by B. Z. Segall, of New Orleans. Mr. Segall made a very interesting report, some parts of which were highly technical. He described in detail the method proposed by the committee for calculating feeder sizes for single and group installations and he also described each type of welder in detail. His description of the stored energy type was very thorough and this was the first time, perhaps, that many inspectors had the opportunity of learning about this type of welder.

At the concluding session of the conference, a report was heard from the nominating committee headed by J. L. Speights. The nominations of this committee were elected unanimously and included the following: president, E. C. Knox, Miami; first vice-president, G. M. Ross, Sheffield, Alabama; second vice-president, M. G. Folkes, Richmond; and secretary, A. M. Miller, Richmond. Elected to the Executive Committee were B. Z. Segall, New Orleans, chairman; George Welman, New Orleans; J. L. Speights, Richmond; C. S. Whitaker, Durham, N. C., and L. A. Turnage, Hartsville, S. C. Elected to the IAEI Executive Council were F. G. Camus, of Shreveport, and N. E. Cannady, of Raleigh, N. C. N. E. Cannady was also elected a member of the Electrical Committee with J. G. Fisher, of Jackson, Miss., as alternate member.

An invitation to the Southern Section to meet in Dallas next year was extended but action was deferred leaving this matter in the hands of the Executive Committee.

Lip Microphone for Troops

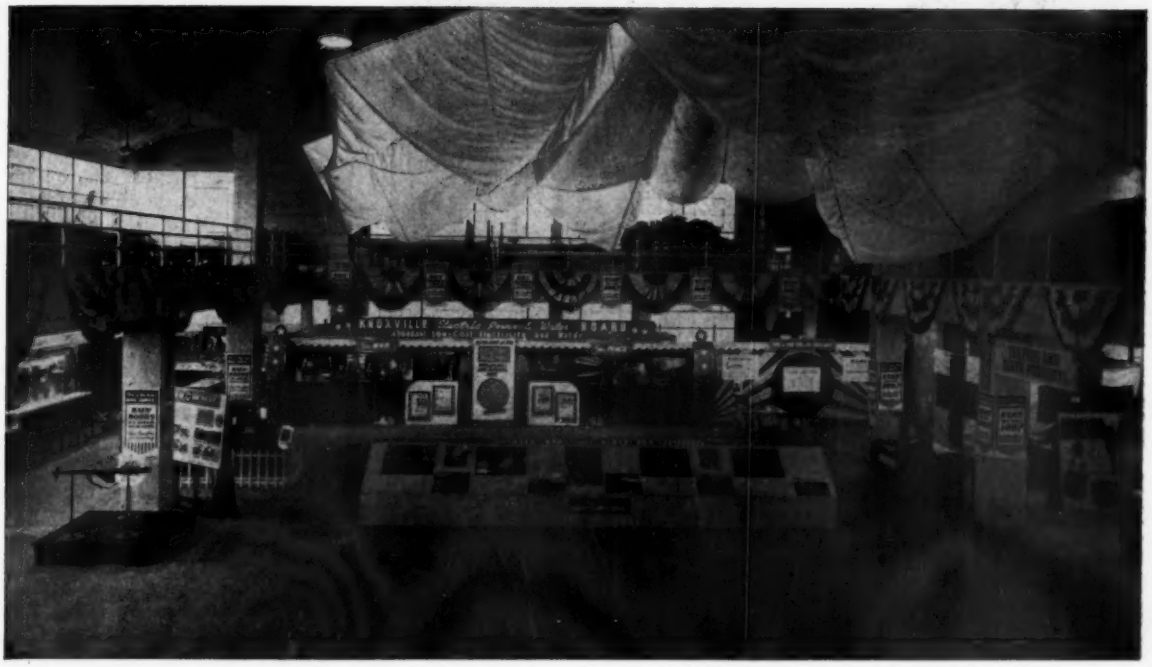
A feather-weight "lip microphone" enabling troops to talk even under extremely noisy conditions as during landing operations, in planes, etc., has been made available to the services. The tiny unit is immersion-proof, and fits under the standard bucket helmet.

New Lights for Stores

Industrialists estimate that 1,500,000 stores in the United States need relighting. New type, flexible fixtures adapted to specialized needs will be available after the war.

Electronic Role on Battleship

More than 1,600 electronic tubes serve a battleship, and an aircraft carrier must have 1,550, according to the Navy.



Postwar Industry Featured In Knoxville Exhibit

WHEN our boys come marching home—what then? The question was asked and answered in an unusual display, first of its kind in the United States, at a "double feature" Army Show and Industrial Exhibit, arranged in Knoxville, Tenn., by the Knoxville Electric Power Board.

A total of 130 industries cooperated. Displays were arranged which showed what each war industry was making now, what products it would make after the war, and what reconversion would be necessary.

An Army show was given in connection with the industrial exhibits, the first time that had been attempted, and the idea was such a success that officials flew down from Washington to see how it was accomplished. They considered extending the plan to other cities.

The Army's display was called "This is The Army, Mrs. Jones" and the industrial exhibit "This is Knoxville, Mr. Jones."

Max C. Bartlett, Power Board general manager, in a letter to employees afterwards said the show was a "wonderful success" and that it was "made possible through the cheerful attitude and the willingness of our employees to put forth their best efforts possible."

Thirty thousand Power Board bill inserts had been sent out in advance.

The Industrial Exhibits

Many of the exhibits were more than the usual display of products. Electricity played an important part in giving the show life. Power machinery was in operation at the exhibit building.

A textile loom clattered, actually turning out Army tent cloth. That same mill had a display showing the various products possible after reconversion.

Power stamped out buttons on a press—buttons for soldiers now, but buttons for civilians later.

An electric punch press took bites out of sheets of metal and formed any patterns desired for war work now—for civilian products on reconversion.

A flip of an electric switch and even a miniature cement plant, complete in every detail, went into operation, just as the large plant in Knoxville does.

Then there were jeeps to take War Bond buyers for rides. War industries loaned their Army-Navy "E" banners to unfurl across the show building. Posters urged "Stay on the Job" and "Buy War Bonds."

The Power Board's own display pictured industries at war work and at peace work. In between, ten feet high, was this message, which was the basic theme for the combination exhibit.

"The War is Not Yet Won.

"Victory will not be ours—not till the last enemy gun is silenced—not till the casualty lists cease—not till the words 'killed', 'wounded', 'missing in action' no longer hover over our boys and girls.

"We must continue to provide our fighting forces with everything they need to speed the day of that victory and to bring them safely home.

"WHEN OUR BOYS COME MARCHING HOME.

"When our boys do return—what then?

"In these exhibits you have seen

The Knoxville Power Board's exhibit included giant photos of industry at work on war products and peacetime goods. In the center was the panel shown here with its inspiring message.

how bright the prospects are for the postwar Knoxville area. Our industries have no major problem in reconverting from war goods to peacetime products. Our manufacturing plants are planning ahead. They see postwar markets awaiting them which will provide employment not only for their returning servicemen and for their present employees, but for hundreds of new workers as well—both men and women. So, until V Day comes . . .

"Stay on the job! Buy Bonds and Speed Them Home."

How to Check Your Lighting Under Wartime Conditions

THE LEAST anyone can do nowadays is to use the amount and quality of light that are actually available to the best possible advantage. Here are some of the things to remember and to watch out for.

In sizing up any lighting situation, remember there should alway be more light on the work than at the eyes; about five times as much for the best seeing conditions. This can be checked with your light meter.

The key to successful elimination of much eye trouble and strain on close work is not to have too much contrast between the brightness of the working area and the surroundings. Suppose, for example, a workman must frequently turn from brightly lighted work to consult blueprints, charts, etc., or simply to rest his eyes by focusing them on a far object.

When the area to which his eyes turn is of much lower light intensity, the effect on his eyes and on his nerves is very bad.

The eye is most comfortable when contrasts between work area and surrounding areas are not too great. Having, perhaps, three to five times as much light on the work as on the surroundings will help keep attention focused where it belongs—but—if the work is made too much brighter, the worker's eyes will eventually tire. In these cases, general lighting in the room should be brought up.

The amount of light on the work should never exceed ten times that of the room as a whole, or more than fifty times the darkest area visible.

Good general overall lighting is essential to reduce contrasts. Glare, for example, diminishes or disappears when the general lighting level is raised sufficiently. Don't pile up brightness in any one spot—especially in the worker's eyes. It's all right to have plenty of brightness at the point of work if plenty of light is distributed around it. Fluorescent light is naturally well distributed, and incandescent light can also be well distributed by the proper location and arrangement of reflectors.

A good rule for obtaining uniform lighting is to see that the space between lighting units does not exceed one and one-half times the hanging height.

For most kinds of work, harsh black shadows are annoying or even harmful. They can be avoided or softened by assuring that the working area is lighted by two or three or more lights. A pencil held erect at the point of work concentration will demonstrate whether there is one harsh black shadow or several softer, almost invisible shadows. For some purposes—inspection, for example—strong shadows are sometimes desirable, and one strong direction of light should be used.

For many operations, concentrated light from a local light source is still essential. Do your best, then, to provide properly shielded, not too shallow units that keep the light on the work and away from the worker's eyes and from the eyes of his fellow workers, and so placed as not to create reflected glare on the work or polished parts of the machine.

Fixtures of improper design, lamps too big for the fixtures, or fixtures hung too low will result in direct glare into the workers' eyes, causing eyestrain and fatigue. Fixtures of the proper design, with lamps of the correct size mounted out of the line of vision, will relieve this condition.

Reflected light from the work is something to watch out for, too, when working on bright or shiny surfaces. The proper location of the light sources naturally helps to overcome objectionable reflected light. But the amount of light that can be used without resulting in reflection trouble depends, of course, on the b r i g h t n e s s of the surfaces dealt with. Reflections from close-up lighting units

(Continued on page 65)

PRELUDE TO A

Prefab Job

Ready for Navy inspection . . .

on Time

via GraybaR

The Green Lumber Co., of Laurel, Mississippi had a Navy contract for 175 prefabricated buildings, IF — the "IF" was a tough one. It called for completion of one unit — wired and ready for inspection — within one week! These were not ordinary prefabricated buildings. They were designed for housing navy training devices which called for plenty of electrical power.

Normally, the electrical wiring supplies for a project like this would be mobilized over several weeks or even months, as the preliminary construction proceeded. But here, "sample" lots of all items from dozens of different manufacturers had to be on the job within two or three days.

The Graybar Man took the bill of materials and went to work. Some items came out of local stocks. Others were located at various GRAYBAR stock points near-by. A few other unusual items not in stock were rushed from manufacturers overnight. All the electrical supplies, from panel boards to fans, needed for the first building were on the job in time to complete the sample assembly.

Within the week, when the completed building received its O.K., electrical materials for *twenty more* had been mobilized and were on their way to the contractor. Delivery schedules were worked out to insure a steady supply of material for the entire project — via GRAYBAR.

Can this fast-moving service do as much for you?

For "sample" quantities overnight, or production quantities delivered on a regular week-to-week schedule, you'll get fast-moving help from your local GRAYBAR "procurement advisor." GRAYBAR can save your time in choosing the right electrical items for the job, in seeking out available sources, in centralizing responsibility, by bringing together all the products that go together on the job. Why not call in the GRAYBAR Man today? His services are available through your electrical contractor or direct if you have your own electrical department.

3527

MOBILIZED MATERIALS No. 19 of a series of actual examples of GRAYBAR service, providing electrical materials to be installed in ships, planes and in war facilities.

GraybaR

IN OVER 80 PRINCIPAL CITIES

Executive Offices: Graybar Bldg., New York 17, N.Y.

GraybaR 75 YEARS OF *Electrical Distribution*

NEWS of the INDUSTRY
National and Southern

POSTWAR PROGRAM ON PORTABLE LAMPS

Believing that the time is not far off for the removal of WPB restrictions on the manufacture of portable lamps, the Advisory Board of the IES Better Sight Lamp Manufacturers has decided to resume organization activities on Nov. 1st, thus answering numerous questions as to whether there will be any postwar promotional program for "certified" portable lamps.

As is the case with many cooperative promotional activities, the plans of the certified lamp makers are fluid rather than fixed, but according to Foster & Davies, of Cleveland, advertising and sales counsel for the group, all possible angles are being anticipated—new uses of metal, glass and plastics, new applications of light sources and new marketing and "industry" conditions.

Electrical Testing Laboratories, Inc. of New York will continue as the testing and certifying authority and the Certification Plan undoubtedly will extend beyond the so-called scientific or sightsaving lamp to include almost every kind of portable lighting units. Foster & Davies points out that many lamps are designed, not for reading or sewing or bridge, but for much less critical seeing tasks, or merely to provide a decorative touch and since the factors of mechanical excellence and electrical safety are present, the same as in a reading lamp, the buyer of a "non-scientific" type of lamp is entitled to all the protection that the Tag of Certification carries.

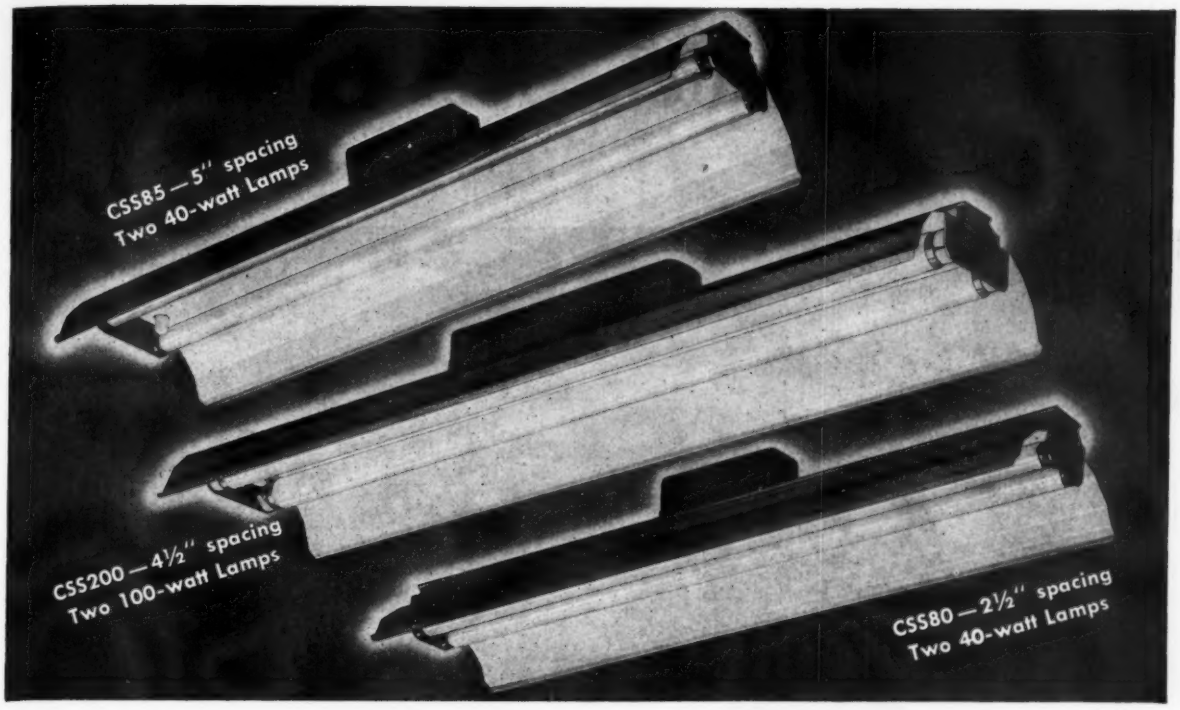
Before war restrictions set in, some 60 portable lamp and shade manufacturers participated in the IES Better Sight Lamp program and with the broadened scope of the operation the lamp people are enthusiastic as to the possibilities, once the new program gets underway. They point out that the first certified lamps to come after the "thaw" probably will look like the last ones before the "freeze", but they predict that developments already perfected, to say nothing of those now in the laboratory stage, assure a postwar product far beyond anything of the past, in footcandles, in quality of light and in decorative design.

ELECTRONICS IN LIGHTING—The relationship between many types of electron tubes and lighting applications was dramatically demonstrated before engineers of the Georgia Engineering Society, the Georgia Section of the American Institute of Electrical Engineers, and the Georgia Chapter of the Illuminating Engineering Society, by D. P. Caverly, of Sylvania Electric Products, Inc., of Salem, Mass., in a joint meeting at Atlanta. Shown here is the novel demonstration board nearly 12 feet long and 8 feet high which Mr. Caverly used to supplement his address.

UTILITY COMPANIES POSTWAR POSITION

A carefully prepared forecast as to postwar conditions in the electric power industry with respect to generating capacity and sales of electricity was released today by the Commercial Planning Committee of the Edison Electric Institute in a report to the industry. These conclusions are reached in the report:

"The postwar outlook for the business-managed electric utility companies, as a whole in this country, is that during the period of readjustment there will be no great amount of idle plant capacity, hence no cause for distress selling. There should be enough capacity available to warrant and stimulate renewed effort to sell more electricity, to find new fields of usefulness and to exploit further possibilities in the older fields. The competition again will be for a share of the consumer's dollar. It will be competition of the keenest type but electric utility companies, confident of the value of the service they offer, expect to load up the relatively small margin of unused capacity in a few years after the war is over.



HOLDENLINE FLUORESCENT

High Efficiency... Low Service Cost

If you are going to install Fluorescent lighting in your plant, or wish to add to what you now have, we suggest that you request your wholesaler to install the HOLDENline CHAN'L-RUN illustrated above. Conversion from single units to continuous run is simple and quick. New Butt-On sockets eliminate all breakage because HOLDENline mounts the Butt-On sockets on heavy steel end plates. That supports them firmly to the channel. Lighting efficiency is so good that there's been a continuous run (no pun) on them ever since we got into production. Standard sizes . . . At your wholesaler's. For more information, ask for Catalog B-45.

Sold only through Wholesalers

THE HOLDENLINE COMPANY

Pioneers in Fluorescent

1960 EAST 57TH STREET • CLEVELAND 3, OHIO

How much postwar power

will the Farmer use?

There's little doubt that power consumption on the farm is due for a big jump after the war.

Over 86% of farm families interviewed in a recent survey indicated that they had decided to buy some sort of electrical equipment. High up on the list of desired appliances were steady power users—refrigerators, washing machines, electric pumps, food freezers. *And more than half of these families showed definite preference for electrical cooking!*

Outside of the home, too, electricity will be harnessed to do many farm chores. Electric water systems, brooders, milkers, silo fillers, and hay hoists will be introduced to cut down labor costs, make farming more productive and profitable.

A wider market, too

These figures were gathered from farms already connected to the power lines. But what of the 3½ million non-electrified farms?

Many farmers will find in wartime savings their first opportunity to take advantage of near-by power lines. The Rural Electrification Administration considers it likely that between 200,000 and 300,000 farms will become electrified each year after the war.

Building a bigger power load

A well-equipped farm uses, on the average, 30% more power than an urban consumer. It is not uncommon for really productive farms to pay anywhere up to $400 a year for electric service.

In order for this important market to expand, the farmer must be convinced of the profit-making, laborsaving, timesaving possibilities of electricity on the farm. This must be done before farm savings are siphoned off into competitive channels.

That is why General Electric, through advertising, and other forms of promotion, is already reaching the farmer with the facts about power.

That is why we urge utility companies to join with us in this campaign to encourage the increased use of electrical power on the farm.

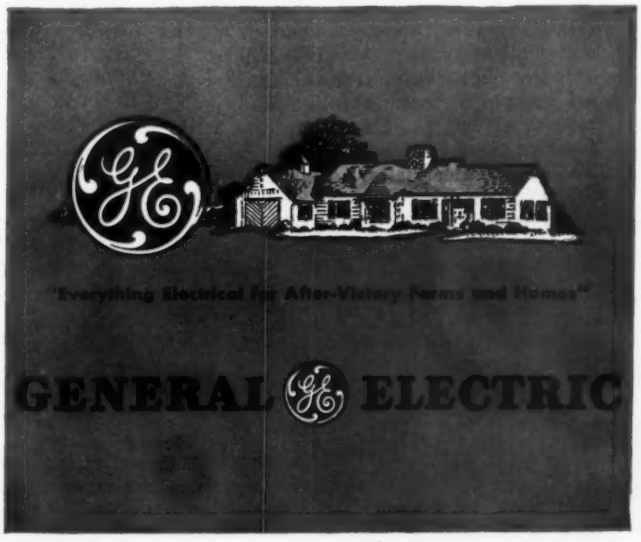
Your stake in the load-building possibilities of this huge market calls for immediate action.

General Electric Co., Appliance and Merchandise Department, Bridgeport, Conn.

[redacted]

General Electric is working night and day to speed the attack.

You can help, too, by buying and holding more War Bonds than before.



TUNE IN: "The G-E All-Girl Orchestra," Sunday 10 p.m., E.W.T., NBC —"The World Today" news, every weekday, 6:45 p.m., E.W.T., CBS.

"The fact that new generating equipment is now being ordered by some companies is the best possible indication to support the validity of this forecast.

"Sales of electricity to domestic consumers by 1950 are estimated to reach a figure approximately 50 per cent greater on a country-wide average than in the peak year of 1943, although estimates for sales by individual companies vary from a minimum increase of 25 per cent to a maximum of 100 per cent in the seven-year span.

"Industrial power sales for the immediate postwar years are expected to return to the level of 1939, and subsequently increase with full scale resumption of normal civilian production. Total kilowatthours sales in all classifications, however, at the lowest point, anticipated to occur three to four years after the European war, are expected to hold at about 35 per cent above the level when the European war broke out."

The report from which these conclusions are drawn is the first of a series to be released this fall by the Commercial Planning Committee of the Institute. Work on the reports has been continuous by this utility group for the past year. Merrill E. Skinner, vice president of the Buffalo Niagara and Eastern Power Company, is Chairman of the Committee.

For the electric utility companies as a whole there will be a gradual rather than sudden shift from business dominated by war expenditures to a civilian economy, the report says. "It is now clear," it adds, "that as soon as materials and manpower are available the companies and the electrical equipment manufacturers will resume efforts to enlarge the residential, farm and retail commercial uses of electricity. A lag may be anticipated between the period when sales promotion is undertaken and the time when its full effect in increasing sales becomes obvious, but in three or four years after the war results should be manifest in sharply rising use of electricity by all classes of customers mentioned."

ADEQUATE WIRING FOR FARM HOMES

In order to speed up the connection of farms to new rural lines as they are constructed after the war, Monongahela West Penn Public Service Company, with headquarters at Fairmont, W. Va., plans an extensive program for the making of actual wiring layouts for prospective rural customers, beginning at the earliest practical moment, according to report by J. R. Waters, residential promotion manager.

A refresher training course for rural contact people on the subject of wiring is being started and the company expects to cover the farms on proposed lines, analyzing the wiring problem in terms of likely production of the farm, and furnishing each customer with duplicate specifications for competitive bidding by local wiremen.

At the same time a survey of the probable "wireman power" likely to be available throughout the area served is in progress, and plans are being made for advance release of information to them regarding the company's new program.

Intensive promotion among wiremen of the company's educational wiring program is planned. Information, literature, demonstration materials and instructions will be furnished where necessary in the training of new wiremen.

Business Manager of Electrical South, Well Known to the Industry, Passes On

JOHN CARL MARTIN, business manager of ELECTRICAL SOUTH for nearly twenty-three years, passed on in a private hospital in Atlanta, on October 31st, after a brief illness.

Mr. Martin first became associated with the W. R. C. Smith Publishing Company in 1911. For several years he served as business manager of SOUTHERN HARDWARE. In 1919 he was elected secretary of the company, and in 1922 he became business manager of ELECTRICAL SOUTH, continuing also as secretary of the company.

He was a member of the Southeastern Electrical Manufacturers Representatives Club and was widely known throughout the South and Southwest through his attendance at meetings of the geographical divisions of the National Electric Light Association, the Edison Electric Exchange, and other industry organizations.

He is survived by his wife and a son, Jack Martin, who is serving in the U. S. Navy.

AROUND a busy plant or shop, a roll of U.S. Security Friction Tape is ready to come to the rescue on dozens of jobs that keep men and machines producing. Security is safe, sure and long-lasting. It's a handy man that pays its way many times over.

Listen to the Philharmonic-Symphony program over the CBS network Sunday afternoon, 3:00 to 4:30 E. W. T. Carl Van Doren and a guest star present an interlude of historical significance.

UNITED STATES RUBBER COMPANY

1230 SIXTH AVENUE • ROCKEFELLER CENTER • NEW YORK 20, N. Y.

SERVING THROUGH SCIENCE

BENDIX TO ENTER HOME RADIO FIELD

The Bendix radio division of Bendix Aviation Corporation, one of the world's largest producers of precision radio, radar and other communications equipment for aircraft and military uses, will for the first time manufacture and market a line of home radio sets as soon as the military situation permits, it was announced recently by Ernest R. Breech, president.

Home radios will be manufactured in the company's plants in Baltimore, it was stated.

"Our decision to enter the home radio field is in line with the company's policy to manufacture certain consumer products which will represent real contributions to the American public in point of engineering advancement and at prices made possible by low-cost production methods," Breech said.

The home radio program will mark Bendix Aviation Corporation's first entry into the consumer manufacturing field, in addition to its variety of scientific equipment for aircraft, automotive, marine and other industries, Breech pointed out.

More than 70 per cent of the highly precise radio equipment required and used by American and world airlines was being produced by the company's Baltimore radio plants before the outbreak of World War II, it was explained by W. P. Hilliard, general manager of the radio division.

The division has pioneered for years in the development and manufacture of aircraft radio receivers and transmitters, ultra high frequency and micro-wave equipment, aircraft instrument landing systems, precipitation static dissipators and other advanced radio devices, Hilliard stated.

"At the same time, the tremendous volume of production for war has pointed the way to production of high quality radio equipment at a price well within the range of the average person's peacetime pocketbook.

"We believe that by entering the home radio field, when the military situation permits, we will be not only making engineering and production contributions to this field, but also will be contributing substantially to postwar employment, both for returning veterans and our present employees."

Improvements in quality and performance of chassis components, speakers and record-playing mechanisms will be characteristic of the complete line of AM-FM home radio and radio-phonograph combinations to be manufactured and marketed by Bendix Radio, Hilliard said.

The entire line will be housed in a variety of quality radio cabinets, incorporating distinctive modern and period furniture designs, it was stated.

"Bendix home radios will be offered to the public at popular prices through carefully selected distributors and retailers, with the support of national and local advertising and sales promotion programs designed to acquaint the public with improvements in home radio reception, recorded music and cabinet design developed by Bendix engineers," Hilliard said.

"Same darn trouble we had with the pre-war models—getting ice trays out!"

PACE REA ACT SIGNED BY FDR

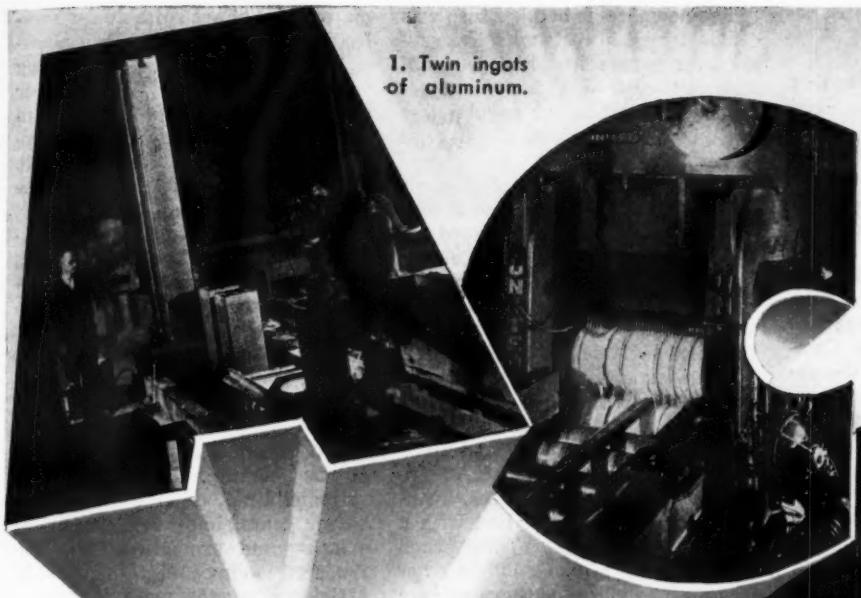
Passage of the Department of Agriculture Organic Act of 1944, and its signing on September 21 by President Roosevelt, opened the way for an eventual broadening of REA-financed rural electrification into "thinner" territory by liberalization of the terms of the agency's loans.

This liberalization is an outstanding feature of the Act introduced in the House of Representatives by Congressman Stephen Pace, of Georgia, to amend the basic legal charters of various agencies in the Department of Agriculture.

Chief features of the act as it affects REA activities are its reduction of the interest rate on all REA loans to 2%, its removal of the time limit on the REA loan program, which had been set at June 30, 1946, and its extension of the maximum amortization schedule for present and future loans from 25 to 35 years under certain conditions. Previous interest rate ranged from 2.46% to 3%.

Additional terms of the Act affecting REA renew its authority to borrow funds from the Reconstruction Finance Corporation, and remove the maximum authorization from the REA loan funds, leaving the amounts to be determined by Congress annually.

Under these provisions, borrowers who might not have been able to finance extensions of service into a given territory on a self-liquidating basis over a 25-year period may find such extensions self-liquidating over the longer period and with the lower rate of interest. They will thus be encouraged to extend further the principle of area coverage, whereby financing of central station power to consumers in less densely-populated areas is made possible.



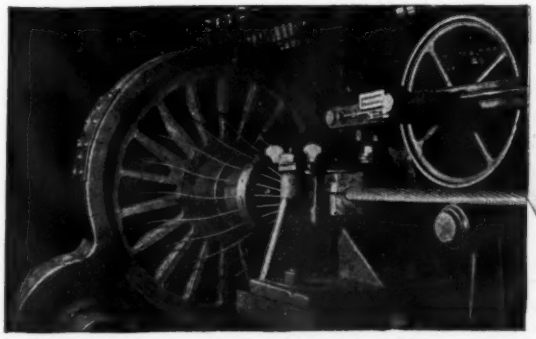
1. Twin ingots of aluminum.

2. Rolled by experts in this giant, modern mill.

3. Large coils result in long lengths of cable.

A.C.S.R. owes its fine quality to this good start in life

More than a million miles of A.C.S.R. (aluminum cable, steel reinforced) now span the nation. Over a quarter century of service on rural and hi-lines testify to the great dependability and economy of Alcoa A.C.S.R. ALUMINUM COMPANY OF AMERICA, 2164 Gulf Building, Pittsburgh 19, Pennsylvania.



5. Stranded into cable, combining steel for strength and aluminum for high conductivity and long life.

4. Drawn into wire on a continuous draw bench.

ALCOA A·C·S·R

ALCOA ALUMINUM

UTILITY ENGINEERS ATTEND CONFERENCE

One hundred and fifty leading power company executives and engineers gathered at East Pittsburgh for a one day power engineering conference recently were told of the latest advances in central station engineering. In a series of talks before members of the Edison Electric Institute Prime Mover and Electrical Equipment Committees engineers of the Westinghouse Electric and Manufacturing Company described progress in the design and construction of steam turbines, a-c generators, switchgears and transformers. Addressing the group were C. B. Campbell, manager of engineering for the Steam Division, C. M. Laffoon, manager of A-C Generator Engineering, M. H. Hobbs, manager of Switchgear Engineering, and J. K. Hodnette, manager of Engineering for the Transformer Division.

In connection with the discussion of advances in switchgear engineering the greatest concentration of power ever sent into a piece of electrical equipment in a public test —nearly 3,000,000 kilovolt amperes, 3 phase equivalent—was used to test a new type oil circuit breaker. In less than 1/12 of a second this low oil content circuit breaker completely interrupted the flow of current from two huge generators especially designed to give extreme values of short circuit current.

The new circuit breaker also was demonstrated in tests with less severe overcharges in which it automatically cleared a fault and reconnected itself to the regular line —all in less than one third of a second.

In addition to the oil circuit breaker a 115 kv boric acid fuse was demonstrated. Designed to handle fault currents of less severity this fuse successfully interrupted and cleared a short circuit of approximately 3/4 of a million kva (3 phase equivalent).

In a spectacular demonstration of the "De-ion" transmission line protector an unprotected 46 kv insulator was "struck" by artificial lightning releasing a power arc of approximately 1,700 amperes. Another 46 kv insulator fitted with a De-ion protector tube discharged the lightning stroke and then immediately interrupted the power arc and restored the line and insulator to normal.

At the session on steam engineering delegates to the power engineering conference were given a glimpse into the future possibilities of the gas turbine.

The gas turbine is one of the simplest of all engines from the standpoint of few moving parts. It is approaching the stage of practical application and has important possibilities for wide use, the engineers were told.

"Rapid development of efficient compressors and turbines, and of materials that are suitable for service at high temperatures has allowed outstanding advances during wartime in the gas turbine power system, which, though very old in principle, had to await these refinements," said C. B. Campbell, manager of engineering for the Westinghouse Steam Division.

Wider applications of the gas turbine in the fields of transportation, in the chemical industry and in connection with blast furnace operation were predicted by Mr. Campbell for the near future.

J. K. Hodnette, engineering manager of the Westinghouse Sharon, Pa., Works, described recent advances in transformer engineering at the meeting. He told of the "streamlining" of transformers in recent years, improvements in insulation and protection, new methods of cooling and of increase in efficiency and decrease in weight through use of Hipersil steel cores. He also described "packaged" substations which can be taken where needed by train and truck for emergency service.

RICHMOND LEAGUE MEETS

The Electrical League of Richmond, Va., held its monthly meeting at the John Marshall Hotel October 9th. E. G. S. Maxwell of the General Electric Company, Philadelphia, discussed "Industrial Electronics." L. L. Bond, League president, presided.

(Left) C. B. Campbell of the Westinghouse Steam Division tells C. C. Willis of the Oklahoma Gas and Electric Company and G. V. Williamson of the Union Electric Company, Missouri, how research advances have been incorporated in modern steam generating stations. (Right) G. M. Armbrust, Commonwealth Edison Company, M. W. Smith, vice-president, Westinghouse, J. K. Hodnette, manager Westinghouse Transformer Engineering, Philip Sporn, American Gas and Electric Corporation, and M. H. Hobbs, Westinghouse, looking over the program of the Power Engineering Conference.

FOR LASTING, DEPENDABLE SERVICE...

rely on these 6 advantages of Transite Ducts

Inorganic . . . made of an asbestos and cement composition compressed under great pressure. This provides permanence and strength. These ducts are also immune to rust and rot.

Permanently smooth bore . . . long cable pulls and replacements are made easier. Danger of damage to cables is minimized.

Easily and quickly installed . . . long, light-weight lengths and simple assembly method assure rapid, economical installation.

Immune to electrolysis . . . being entirely inorganic and non-metallic, these ducts are not affected by electrolysis or galvanic action.

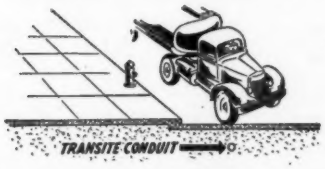
Lower cable temperatures . . . an advantage resulting from a relatively high rate of heat dissipation.

Incombustible . . . won't contribute to the formation of dangerous smoke, gases, or fumes. If burnouts do occur, these inorganic ducts provide maximum protection to adjacent cables and permit easy removal of damaged conductor.

For complete details on Transite Ducts, write for Data Book, DS-410, Johns-Manville, 22 East 40th Street, New York 16, N. Y.

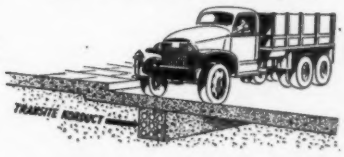
JOHNS-MANVILLE *TRANSITE DUCTS*

TRANSITE *CONDUIT*



Designed for exposed work and for use underground without a concrete encasement.

TRANSITE *KORDUCT*



For use in concrete. Thinner walled, otherwise identical with Transite Conduit.

DISTRIBUTORS CO-OP PLANNED BY QUINN CO.

Sixty independent distributors throughout the country are being organized as owner-branches of Monitor Equipment Corporation, of New York City, for group buying and promotion of about 30 home appliance and equipment lines under the "Monitor" brand, it is reported in a recent issue of *Advertising Age*.

Initiative in the organization is being taken by T. K. Quinn, of T. K. Quinn Company, advertising and public relations counsel, currently serving part time as director general of the War Production Drive, Washington. Formerly vice-president of General Electric Company, Mr. Quinn also was president, for seven years, of Maxon, Inc., advertising agency.

Heads of the distributor organizations will serve as directors of the company and will elect the officers.

The company points out that "about 60% of the consumer's dollar has been represented in sales cost both within the manufacturer's control and after the product leaves the factory. If independent distributors and retailers are to maintain their position in postwar competition, better and lower cost methods must be developed. The way to do it is to concentrate on the merchandising functions, applying the same principles of division of labor, correlation and mass action which have been so successfully realized in production."

"You may have to josh this one along a bit. She's sworn if any collector shows up, she'll blow his head off on sight."

It is understood that only about half of the 60 distributors have been signed, and eight territories are entirely open. The entire group, which may total 65 to 80, would represent a combined annual postwar volume at retail of about $100,000,000.

"The company will not operate on the conventional 30-day cancellation distributor contracts," the announcement says. "Once a member company is accepted it can only be cancelled for cause by democracic vote of the other associated companies. Each distributor has his own independent business and a proportionate ownership in the headquarters company. Every sale he makes popularizes the trade name 'Monitor' of which he is a joint owner. It is planned eventually to extend this same kind of interest to independent retail dealers."

One department of the company will be devoted to aiding returned servicemen to establish independent dealer-business, not in competition with other Monitor dealers.

Monitor would enable "small and medium-size manufacturers successfully to compete in the national market without setting up prohibitively expensive sales organizations of their own." It also would buy, on occasion, from large manufacturers.

"Products are selected," the company says, "according to their nature, quality and use, and the repu-

35TH ANNIVERSARY FOR S & M LAMPS—Congratulations were in order recently when the S & M Lamp Company, of Los Angeles, celebrated its 35th anniversary. The occasion was marked by a special announcement mailed to 4,000 customers and friends. In the picture, taken at a banquet for officers and employees, from left to right are Barney DeRamus, director of market research; Jim Shirreffs, president; Orville Butler, service engineer; and Bill Shirreffs, vice president.

SECTION OF BOARDWALK, WILDWOOD, N. J.

CONSTRUCTED BY CITY ENGINEERING DEPARTMENT . . . THE DUALCOTE CONDUIT WAS DISTRIBUTED BY BORSTEIN ELECTRIC CO., CAMDEN, N. J.

Before deciding upon what conduit to use for the boardwalk at Wildwood, New Jersey, the city engineer wanted to be sure that it would resist corrosion from salt water. He drove a section of DUALCOTE into the sand offshore leaving one end exposed to every high tide. It was left there for 14 months. The result was the barnacle encrusted oddity pictured here. But when the barnacles were scraped away the DUALCOTE finish was still intact, and as "good as new."

Naturally, after passing this severe test, DUALCOTE conduit was used exclusively for the wiring circuits. And they will be serving dependably as long as the boardwalk stands. The engineer who made this test and specified DUALCOTE is Mr. J. E. Olwell, City Electrician of Wildwood.

DUALCOTE GIVES DOUBLE PROTECTION

DUALCOTE is able to stand up strong under such severe punishment because it is protected by a combination of two resistant coatings. First, by the Walkerizing Process, a layer of zinc is fused into the inside and outside walls of the conduit—and so uniformly that even the threads are protected. Being actually alloyed with the steel, the zinc coating will not crack or flake when bent. To the outer zinc coating, a second coating is added—a new material, which prevents salt water and strong chemicals from eroding the underlying protection.

When wartime restrictions are lifted, DUALCOTE will again be ready to defy corrosion in chemical plants, refineries, dye houses, mines, mills, and other installations. In the meantime, it will pay you to learn more about DUALCOTE. Ask your distributor about prices and deliveries. For further information, write to WALKER BROS., Conshohocken, Pa.

WIRE WITH WALKER

WALKER of Conshohocken

Makers of: Rubber-covered, Synthetic and Lastiled Wires and Cables • "Walkerflex" Non-metallic Sheathed Cables • Service Entrance Cables • Automotive Wires and Cables • Shipboard Cables • Leaded, Non-Leaded, Synthetic or Varnished Cambric Insulation • Electric Metallic Tubing • "Ducasote" Rigid Steel Conduit • "Precast-Insert" Underfloor Distribution Systems.

tation and capacity of the manufacturer. The number of approved products is purposely limited so as to maintain the advantages of specialty distribution, avoid the thin-spread interest of the catalog house, and provide ample potential volume for profitable operation."

Monitor products will include air conditioning units (self-contained), cleaners, clocks, coffee makers, cooling units, fans, floor lamps (metal), furniture (limited lines), fluorescent lamps, home freezers, incandescent lamps, irons, ironing boards and machines, kitchen mixers and appliances, percolators, pumps and home motors, radio receivers and phones, gas, oil and electric ranges, refrigerators, roasters and cookers, electric tools, television sets, toasters, electronic tubes, washers and waffle irons.

Postwar designs of future appliances develop swiftly under the nimble fingers of their creators at Landers, Frary & Clark. Highly skilled draftsmen in the Universal Engineering Division are shown busily engaged in working out new plans for "V" Day products.

BUILDING BACKLOG NOW TEN BILLIONS

The backlog of construction projects awaiting the relaxation of government controls and the availability of man power and building materials exceeds 10 1/2 billion dollars, it was reported recently by F. W. Dodge Corporation, fact-finding organization for the construction industry.

The data were compiled after special inquiry by Dodge's field staff directed to more than 400,000 persons representing city, county, state and federal government agencies, private industry, commercial, religious, social, educational and other organizations, individual prospective home builders, operative home builders, architects, engineers, contractors, insurance companies, banks and other institutional mortgages. The compilation covers all states east of the Rocky Mountains.

School and college buildings, hospital buildings, manufacturing, loft and office buildings, and churches —in the order listed—are the principal non-residential classifications reported. The backlog of school and college buildings alone amounted to $767,930,000, and all nonresidential building to $2,676,373,000.

In the residential field, Dodge reported a backlog of slightly less than a half billion dollars for one-family dwellings to be built for owners to order and by operative builders for sale or rent. The total of residential building, including apartment houses, dormitories and hotels, was $1,032,066,000.

ELECTRICAL LEAGUES ELECT NEW OFFICERS

The Ninth Annual Conference of the International Association of Electrical Leagues, held at the Book-Cadillac Hotel, September 20-22, topped all previous records for attendance since the organization was formed. The program revolved around the theme, "Translating Plans Into Action for More Electrical Jobs After V-Day", and covered all major markets of the electrical industry.

Electrical League managers, and others representing various branches of the industry, from all parts of the country, attended and participated actively in the discussions. Wide interest was indicated in getting ready now to explore the market possibilities for electrical products and services, with a view to being prepared to undertake the objective implicit in the theme of the Conference, when circumstances permit.

The third day of the meeting was devoted to a discussion of the intimate problems of operating an electrical league, and the election of officers for 1945.

E. P. Zachman, business manager of the Cincinnati Electrical Association, was elected president; V. W. Hartley, manager-director of the Pacific Coast Electrical Association, vice-president; and John A. Morrison, manager-director of the Electrical Association of Philadelphia, treasurer. O. C. Smith, of the National Electrical Mfgrs. Assn., was reappointed secretary.

TEXAS WHOLESALER TAKES NEW QUARTERS

Southern Equipment Company, San Antonio, Texas, wholesale distributors of electrical appliances and accessories, have moved to a new home at 210-212 W. Commerce Street. They were formerly located at 419 S. St. Marys.

Their new location, a four-story building, will give them 30 per cent more floor space, and provide ample facilities for the ambitious post-war program that they have mapped out. The Premier line of vacuum cleaners has been added, display facilities have been increased, and more personnel added.

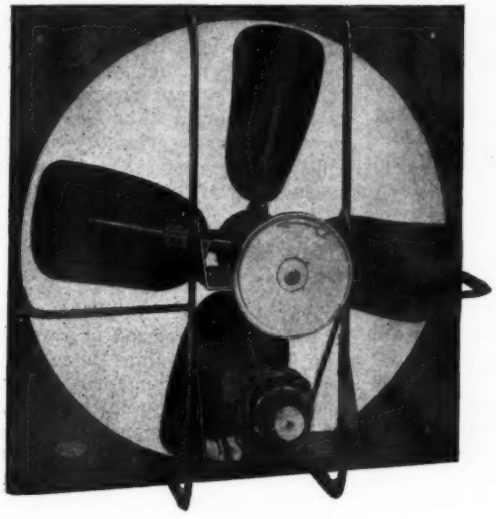
Electrical lines distributed by this firm, in addition to Premier, include Zenith radio, Cory coffee makers, Zenith hearing aid, Sunbeam mixmaster, Emerson fans, Toastmasters, Universal small appliances and G.E. lamps.

Officers of the company are: Reagan Houston, president; Oscar J. Brunner, vice president; and Sidney Allen, secretary-treasurer. Frank G. Atwater is general manager in charge of operations.

JOHNSON Health-aire PRODUCTS
Climate as you like it

Health-aire Belt Driven Propeller Fans...

Available in sizes 24 to 54 inches and capacities 4,500 to 25,000 C. F. M.



Here are Health-aire Features

- All steel welded construction
- Capacitor, long hour, resilient mounted motors
- Bronze, self-aligning bearings
- Dynamically and statically balanced for quiet operation
- Adjustable tension, over-powered drives
- Rated and tested in accordance with ASHVE and NAFM codes for propeller fans.

FOR "climate as you like it" . . . for a full measure of comfort and ventilation in all residential, commercial, industrial and public buildings, the Johnson **Health-aire** belt driven fan is your best bet!

Backed by 25 years experience in designing and manufacturing propeller fans and blowers, Johnson **Health-aire** belt driven fans combine the most advanced, the most effective engineering ideas.

For manufacturing plants, laboratories, offices, restaurants, hotels, grocery stores, auditoriums, churches, funeral homes and all other similar places, Johnson **Health-aire** fans are guaranteed to give the finest performance.

These fans are available in sizes 24 to 54 inches and in capacities of 4,500 to 25,000 C.F.M. Order Johnson **Health-aire** belt driven propeller fans for all your needs today!

Are You Set for Next Spring Deliveries?

Johnson Fan & Blower Corporation invites your correspondence concerning delivery and distribution set up for next spring. Anticipate your requirements now! Write Johnson today for full details concerning our plan that will supply you with your needs for next spring and summer.

JOHNSON FAN & BLOWER CORPORATION

1319 WEST LAKE STREET CHICAGO 7, ILLINOIS

STANDARD TRANSFORMER'S 25TH ANNIVERSARY

In observance of Standard Transformer Company's 25th year in the transformer manufacturing business, sales and engineering representatives from all district offices gathered at the home office in Warren, Ohio, on August 22, for a factory inspection, sales conference and banquet.

During the day's program, a suitably engraved watch was presented by W. F. Parker, president, to Miss Marabelle Sutton, secretary and treasurer. Miss Sutton has been with the company during the entire twenty-five years of its existence.

The Packard Electric Co., founded in Warren, Ohio, in 1890, made many of the first transformers built in this country. From the pioneer transformer days up to the time that the Packard Company decided to discontinue their manufacture in favor of the automotive field, a reputation for excellence in quality was firmly established. Millions of KVA of Packard transformer capacity are still today in service.

When Packard discontinued the manufacture of transformers, key executives, engineers and workmen went with Standard to continue there the manufacture of the products with which they were so thoroughly familiar. Standard thus has a background of quality design and construction based on experience covering over fifty years and nearly all of the period of American transformer history. Today the company produces transformers up to 10,000 KVA in capacity and in types to fill all applications.

The Standard Company, while steadily expanding its facilities over the years, has remained at one location in Warren, Ohio. It has representation in all major cities.

Gathered at Standard Transformer Company's 25th Anniversary—visiting sales representatives and the home office sales and engineering department personnel.

Government News and Views For the Electrical Industry

COOKING EQUIPMENT IN PRODUCTION AGAIN

The War Production Board has removed distribution controls from commercial cooking and food and plate-warming equipment. Action was also taken to permit production of certain items of food service equipment that have been prohibited from production since early in 1942, WPB reported.

Changes in Order L-182 (Commercial Cooking and Food and Plate Warming equipment) permit manufacturers to distribute their production equitably through normal distribution channels. WPB reserves the right, however, to direct the distribution of specified amounts from any manufacturer's production to meet emergencies.

The following items of equipment have been removed from Schedule I of L-182, which prohibited their production:

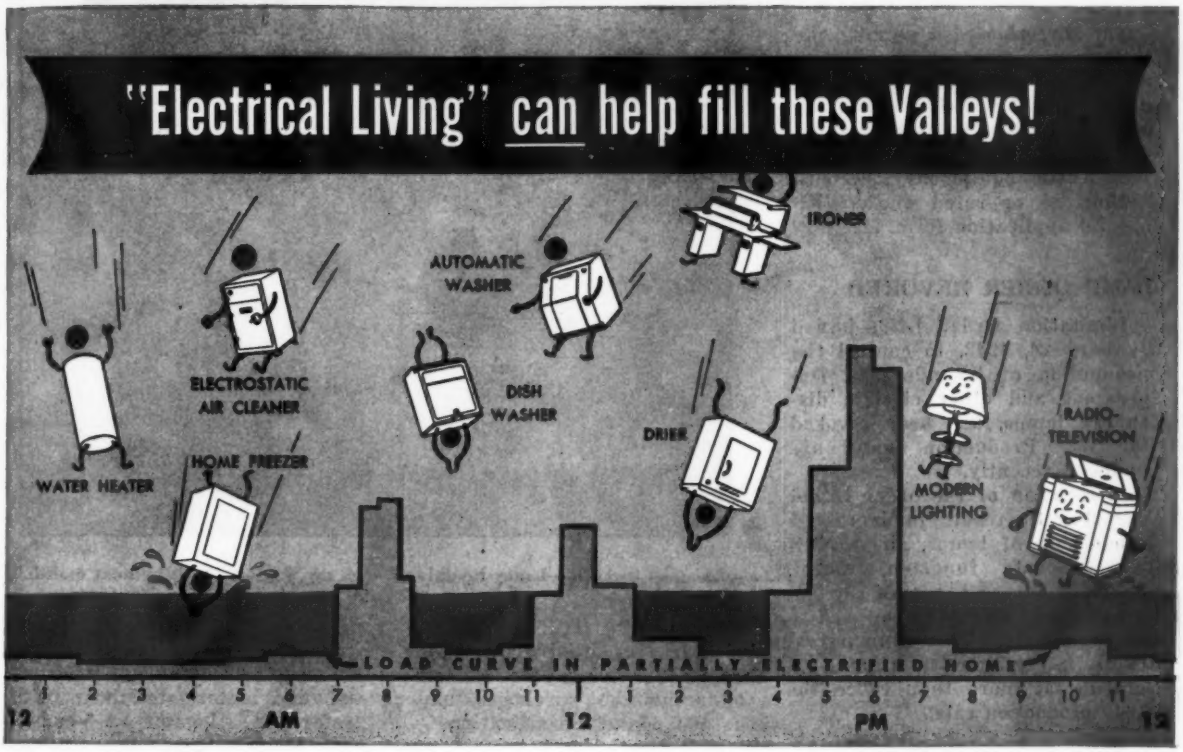
Barbecue machines, chicken singers, chop suey ranges (ranges with built-in kettles and water and sewer connections), cruller fryers, cup warmers, dish warmers, egg boilers, nut blancher ovens, nut fryers, nut roasters, oyster stoves, peanut roasters, plate warmers, potato chip fryers, roll warmers, rotisseries (revolving spit barbecue machine), sausage warmers, waffle irons and warming ovens.

ORDER L-41 AMENDED

Any piece of building service equipment authorized or rated by the War Production Board on a special application form, or any piece of processing or service machinery or equipment whether or not specifically approved, may now be installed in an existing building without permission under Conservation Order L-41, regardless of cost limits, the War Production Board reports.

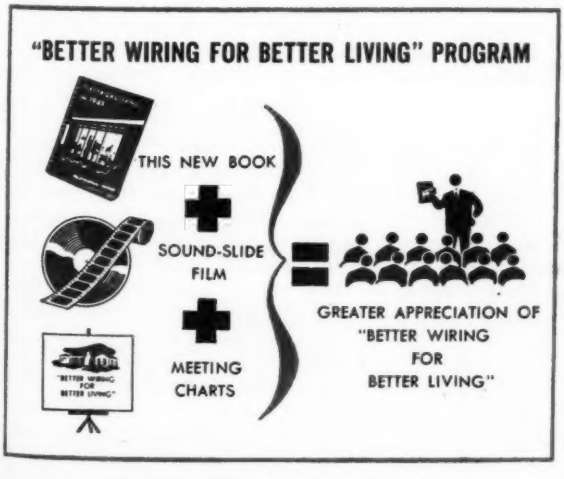
This action is taken by amendments to Conservation Order L-41 and to Direction 2 of the same order.

Direction 2, as amended, provides that it is not necessary to get WPB permission under L-41 to install or relocate in an existing building any piece of processing or service machinery or equipment regardless of the total cost of the job. Processing machinery or equipment is machinery or equipment used for the manufacture, processing or fabricating of materials or products. Service machinery or equipment is defined as equipment used in a building by means of which a particular service is rendered in the building; for example, X-ray equipment in a hospital, projector or screen equipment in a theatre, cold storage enclosures of coolers



WITH the resumption of normal peacetime production, many types of home electrical equipment will be available to help utilities *fill the valleys* between the morning, noon, and evening peaks.

New electrical equipment such as home freezers, electrostatic air-cleaners, laundry driers, and television sets—as well as the more familiar electric ranges, water heaters, washers, ironers, etc.—will create a new standard of "Electrical Living" after the war.


"BETTER WIRING FOR BETTER LIVING" PROGRAM
THIS NEW BOOK
SOUND-SLIDE FILM
MEETING CHARTS
GREATER APPRECIATION OF "BETTER WIRING FOR BETTER LIVING"

But the bottle-neck limiting the widespread use of such load-building equipment will be, more than ever, *the inadequacy of home wiring.*

The "Better Wiring for Better Living" Program . . . *consisting of the new book, "Electrical Living in 194X," a sound-slide film, and meeting charts* . . . has been developed to help utilities break this bottle-neck.

Many utility representatives are now using this material in selling the need for *better wiring* —to architects, builders, engineers, contractors, wiremen, and others interested in building—and to present and prospective home owners.

For complete information regarding the "Better Wiring for Better Living" Program, communicate with your Westinghouse District Office or write: Better Homes Department (ES 114), Westinghouse Electric & Manufacturing Company, Pittsburgh 30, Pennsylvania.

Westinghouse

Plants in 25 Cities Offices Everywhere

TUNE IN: John Charles Thomas, *Sunday 2:30, EWT, NBC.*
Ted Malone, *Mon. Wed. Fri. 10:15 pm, EWT, Blue Network*

in a store or commercial establishment.

The direction also permits the installation of building service equipment, such as plumbing, heating, lighting, air-conditioning equipment, elevators or escalators, regardless of the total cost of the job, if the equipment has been authorized or rated on a WPB special application form.

"Just set it down—I may be able to work my way over to it by next month."

LAMP ORDER REVOKED

Limitation Order L-28, issued January 24, 1942, to control the production of incandescent, fluorescent and other electric discharge lamps, has been revoked the War Production Board announced recently.

Revocation of the order is not expected to result in increased production of lamps, since WPB will allocate tungsten, nickel, molybdenum and copper in approximately the same quantities as previously. The 33 manufacturers in the industry are now operating at more than twice the 1940 production rate.

Limitation Order L-28-a, containing specifications for the 1,800 permitted types of incandescent, fluorescent and other electric discharge lamps, remains in effect.

WIRE RULES CLARIFIED

The War Production Board has clarified the provision covering the amount of copper wire and cable that electricians, electrical contractors and repairmen of domestic appliances, radios, and refrigerators are permitted to purchase under provisions of Controlled Materials Regulation 9-A.

Considerable misunderstanding has existed among repairmen and wholesalers about these provisions and has resulted in the sale of more copper wire and cable for repair purposes than was intended, WPB officials said.

Under no condition, officials emphasized, should any repairman buy or any wholesaler sell any copper wire or cable for electrical conduction under the provision of CMP Regulation 9-A, which permits repairmen covered by the regulation to purchase each quarter a total of 500 pounds of copper and copper base alloy brass mill and foundry products. It is not intended that wire mill copper products, including wire and cable (bare, insulated, armored, and copper-clad steel) for electrical conduction be purchased under the 500 pound classification.

CMP Regulation 9-A does, however, permit certain repairmen to purchase $150 worth of copper wire and cable each quarter or one-eighth of what the purchaser used in making repairs in 1941 (figured as accurately as possible in dollar value), whichever is more. Only refrigeration, radio, and domestic appliance repairmen and electricians and electrical contractors are eligible, however, officials explained.

CONDUIT ORDER EASED

Restrictions on the installation of electrical conduit, electrical metallic tubing and raceways have been removed from Order L-225, the War Production Board announced in October.

Formerly, installations were permitted only for specified end uses. Restrictions were imposed as a temporary measure to save critical materials. Their removal is now possible because the supply of the type of steel used in the manufacture of conduit, tubing and raceways has eased, WPB said.

The amount of metal (by weight) that may be used in the manufacture of this equipment is still limited by L-255 on the basis of the amount used in 1941. The order also retains provisions restricting sales by manufacturers and distributors to those with preference ratings of AA-5 or better. Manufacturers are still required to make monthly reports to WPB on sales and shipments.

INFORMATION ON MOTORS

Repair shops needing standard model, rebuilt fractional horsepower motors for replacement purposes may obtain information from the War Production Board regarding the acquisition of such motors, WPB's Electrical and Mechanical Repair Section announced recently.

Information regarding the acquisition of rebuilt motors for repairing domestic refrigerators, washing machines, oil burners, coal stokers, commercial refrigeration systems, pumps or any other motor-driven appliances can be obtained by writing to W. T. Wessels, Used Motor Section, WPB, Temporary "E" Building, Washington 25, D. C. That office receives reports on used motor sales and deliveries and maintains current records of the availability of rebuilt motors.

The supply of new motors for civilian repair needs is still insufficient and deliveries of those that are available are often considerably delayed, officials explained. Demands from the army services for small fractional horsepower motors have caused the shortage.

Here is PRACTICAL Postwar Planning

Ask your Hotpoint distributor to show you this material—planned for Hotpoint dealers to help them make the most of their postwar markets. It's sure-fire, it's timely right now and it's mighty important to you.

HERE ARE SOME SUBJECTS COVERED

Your Hotpoint distributor will gladly show you the presentation pictured at right covering, among other things, these important subjects:

1. How big will the building boom be? Estimates by leading authorities concerning the great number of postwar homes. What this can mean to you as a Hotpoint dealer.
2. How many old homes will be modernized? Another great boom for Hotpoint—and for you.
3. The great replacement market—for appliances now wearing out by the hundreds of thousands.
4. Why people will be *able* to buy—"pent-up" purchasing power estimated at over 100 billion dollars.
5. Why 77% of new homes will be in price range for Hotpoint Kitchens.
6. What Hotpoint has done and *is doing* to help you take advantage of the greatest building and modernizing boom in a lifetime—preselling your prospects.
7. How Hotpoint helps you specifically. Promotion helps. Copies of "Your Next Kitchen" by Hotpoint—the practical Kitchen Planning Guide being made available to your prospects. 300,000 copies have already been requested!

DON'T WAIT. NOW IS THE TIME!

Get in touch with your Hotpoint distributor, who will gladly present full details about this helpful program. Or mail the coupon to us and we will see that you get full information.

Edison General Electric Appliance Company, Inc.
5614 West Taylor Street, Chicago 44, Illinois

BETTER CARE LESS REPAIR

Ask your Hotpoint distributor to show you this presentation and this Kitchen Planning Guide—or mail the coupon below.

ARMY NAVY

Edison General Electric Appliance Company, Inc.
5614 West Taylor Street, Chicago 44, Illinois

I want all the tools I can get to take advantage of America's Biggest Appliance Boom. Please send full details.

*Name*_____ *Title*_____

*Firm*_____

*Street*_____

*City and State*_____

ELECTRIC **Hotpoint** KITCHENS

REFRIGERATORS • RANGES • WATER HEATERS • WASHERS AND IRONERS • CLOTHES DRYERS • DISHWASHERS • FREEZERS • ELECTRONICS • AIR CONDITIONERS

THE LIGHTING INDUSTRY says.

So the GENERAL ELECTRIC lamp department has commissioned these additional Architects and Designers to work out Postwar Lighting Ideas

DONALD DESKEY

EDWIN H. SILVERMAN

ABRAHAM LEVY

THE JOBS	THE MEN	YOUR MARKET
Restaurant	Donald Deskey Donald Deskey Associates New York	153,000 Eating Places
Furniture Store	Edwin H. Silverman & Abraham Levy, Silverman & Levy, AIA Philadelphia	45,000 Furniture Stores
Florist Shop	Morris Ketchum, Jr. Ketchum, Gina and Sharp New York	16,000 Florist Shops
Large General Office	Louis E. McAllister Philadelphia	600,000,000 sq. ft. of Offices and Warehouse space
Group of Private Offices	J. Gordon Carr New York	
Service Station with Retail Shop	George Cooper Rudolph George Cooper Rudolph Asso. New York	197,000 Gas Stations 66,000 Garages

KEEP BUYING WAR BONDS

GENERAL ELECTRIC

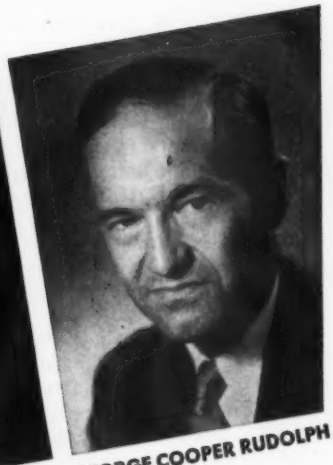
Hear the General Electric radio programs: "The G-E All-Girl Orchestra",

"...MORE!"

MORRIS KETCHUM, JR.

LOUIS E. McALLISTER

J. GORDON CARR



GEORGE COOPER RUDOLPH

WHAT will postwar lighting be like? Early this year, the General Electric Lamp Department announced the commissioning of ten outstanding architects and designers to create new lighting ideas and fixtures suggestions for postwar stores, offices and homes.

Now, as a result of hundreds of favorable comments from members of the lighting industry, fixture manufacturers, architects and designers, General Electric has expanded its program by commissioning several more of the nation's best architects and designers . . . and still more will be announced later.

Each project has been assigned to a recognized authority in the field. And a glance at the opposite page will show you that each represents a large and profitable market that will be ready for immediate development as soon as materials are made available for remodeling and new construction.

Fixture manufacturers already are at work on new fixtures that incorporate design effects suggested in the first ten commissions. The results of the six additional jobs announced here likewise will be turned over to them for development.

The many comments already received, and the thousands of requests for booklets describing the projects, indicate that these postwar lighting ideas already are proving their merit to architects, designers, manufacturers of lighting equipment, to those who sell lighting, and those who use it.

Booklets now are available describing seven of the first ten commissions —two food stores, a drug store, two homes and two department stores. Others soon to be published include an office, a women's specialty store and a home.

Results of the six new commissions announced on these pages will be made available in the same way.

Please write to Div. 166-E S-K, Nela Park, Cleveland 12, Ohio, if you would like a free copy of each booklet already published, or if you would like copies of the others when they are made available.

"TO MAKE G-E LAMPS
STAY BRIGHTER LONGER"
the constant aim of G-E Lamp Research

KEEP THE WAR BONDS YOU BUY

G-E MAZDA LAMPS

Sunday 10 p. m. EWT, NBC; "The World Today" news, every weekday 6:45 p. m. EWT, CBS.

PERSONAL NOTES
About Men You Know

H. M. Kelley, appliance sales manager, Frigidaire Division of General Motors Corporation, Dayton, Ohio has announced the appointment of **F. H. Peters** as manager of range and water heater sales, **J. M. Rushton** as manager of public utility sales and **J. A. Mitzelfelt** on special assignment in appliance sales.

Mr. Peters has been in charge of range and water heater promotion since Frigidaire first started manufacturing these appliances in 1937. He has had broad experience covering 20 years in advertising, sales managements, sales promotion and public relations.

For several years prior to the war, he was assistant sales planning manager on all Frigidaire appliances. More recently he was assistant manager of industrial relations, moving from that position to his new post as manager of range and water heater sales.

Mr. Rushton has spent most of his life in the public utility business. After twelve years with almost every department in the Philadelphia Electric Company he was drafted into the Sales Division and during his five years there, is said to have sold more electric ranges than anyone else. He was finally given the post of sales promotion manager including the direction of sales personnel. In 1937 when the Frigidaire Division of General Motors Corporation began the production of ranges, he joined Frigidaire as manager of range sales and held that position until the cessation of production.

Mr. Mitzelfelt has had wide experience in the sales and merchandising field with Frigidaire, before assuming his new positon on special assignments in appliance sales. He became associated with that organization in 1926 when he became a member of the sales staff of J. J. Pocock Inc., Frigidaire distributors in Philadelphia. Then in succession he was retail representative; district representative; provincial sales manager; educational director of the sales force at Pocock's and finally metropolitan sales manager.

* * *

Ward Leonard Electric Company announces the appointment of **Ken Hathaway** as manager of their Radio Distributor Division. Mr. Hathaway will establish headquarters at 53 West Jackson Blvd., Chicago, Ill., where he will be centrally located.

Ken Hathaway has long been associated with the radio industry and joins the Ward Leonard Company after 2½ years of service with the government in Radio and Radar work. His background includes service as managing director of the Radio Parts National Trade Show.

F. Peters **J. Rushton** **J. Mitzelfelt**

At their 22nd annual conference in Chicago last Saturday, the largest advertising group in the world —the National Industrial Advertisers Association—elected to the presidency, **James R. Kearney, Jr.,** President of the James R. Kearney Corporation of St. Louis. The National Industrial Advertisers Association is made up of more than 2600 advertising managers of leading industrial firms throughout the United States and Canada.

James R. Kearney, Jr.

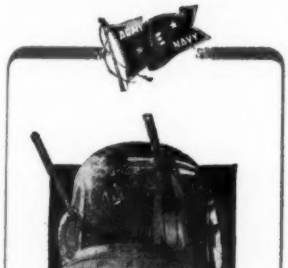
Following in the footsteps of his dynamic father, Kearney Jr. has attracted national recognition as a progressive, alert young business executive. His interest in advertising and sales promotion dates back to the day he got his Master's Degree from the Universiity of Missouri School of Journalism in 1925. He has taken an active part in the activities of the N.I.A.A.—having served the organization as a vice-president in 1936. He was one of the founders of the St. Louis Industrial Marketing Council, having served it as president in 1933.

* * *

The appointment of **John T. Urban** to the position of general appliance manager, with offices in New York City, has been announced by **D. M. Salsbury,** general manager of the Westinghouse Electric Supply Company. Formerly manager of the Indiana Division of the Company, Mr. Urban replaces Harold B. Donley, who was recently appointed manager of the New Westinghouse Radio Receiver Division.

Joining the Westinghouse Electric and Manufacturing Company in the Merchandising Division, Chicago, in May, 1922, Mr. Urban

Welcome back, Friend....



Emerson-Electric power-operated gun turrets and electric motors for aircraft are contributing to final victory on all battle fronts of the world.

Good news! Material has been released for the production of limited quantities of the following Emerson-Electric Fans, for essential civilian and military needs. Sales are subject to W. P. B. regulations.

12 and 16-inch Oscillating Fans . . . 24 and 30-inch Air Circulators . . . 18, 24, and 30-inch Direct-drive Exhaust Fans . . . 36, 42, and 48-inch Belt-drive Exhaust Fans.

(all for 115 volts, 60 cycles)

Emerson-Electric has planned for complete reconversion of production to civilian requirements, and this program will be released as soon as Government restrictions on manufacture and sales are lifted.

To be certain of receiving complete information, when available, ask to be put on our mailing list.

THE EMERSON ELECTRIC MANUFACTURING COMPANY
ST. LOUIS 3, MISSOURI

Branches: New York • Chicago • Detroit • Los Angeles • Davenport

412

EMERSON ELECTRIC
MOTORS · FANS — APPLIANCES

started as a sales assistant. In 1936 he became appliance manager of the Westinghouse Electric Supply Company. Later he became district appliance manager at Chicago. In 1940 he was made Indiana Division manager, the position which he held until he became general appliance manager.

* * *

Major Floyd Slasor, who served overseas in two world wars, and spent the time between in various sales executive capacities for Hotpoint and General Electric appliance divisions, has been appointed to head the newly-formed Hotpoint department store sales division, according to **R. .W Turnbull**, president, Edison General Electric (Hotpoint) Appliance Company, Chicago. The formation of a department store division to study and conduct Hotpoint's merchandising activities with these appliance outlets is seen as a step in recently announced plans to install "complete kitchen" displays and sales programs in large stores.

Major Slasor was recently released from the Army Air Corps after 18 months service in the South Pacific. In World War I he served an equal time in France. Following his 1919 Army discharge, he studied electrical engineering and was graduated from the University of Nebraska in 1924, after which he joined Hotpoint as a sales specialist at Kansas City, Missouri. In 1934 he joined General Electric at Detroit as district sales manager, and in 1939 he became sales manager for Electric Appliance, Inc., General Electric appliance distributor at Indianapolis. Major Slasor is stationed at Chicago headquarters of Hotpoint.

Floyd Slasor

* * *

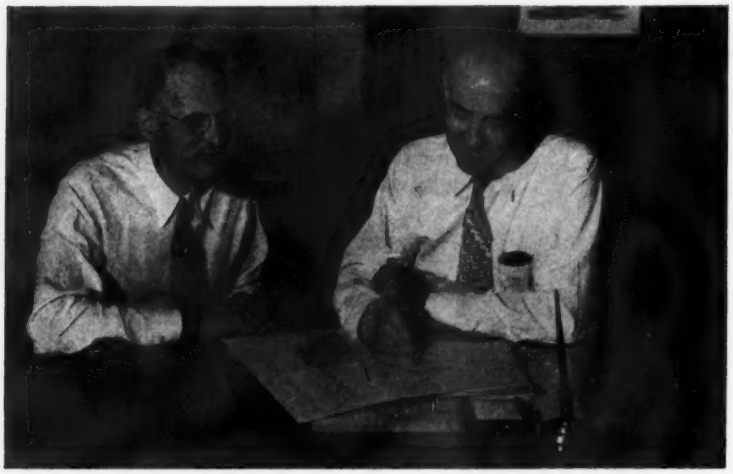
The appointment of **Paul Augenstein** as commercial engineer of General Electric's range and water division has been announced by **J. R. Poteat,** manager of the division.

Augenstein joined the company nine years ago when the headquarters of the appliance department was in Nela Park, Ohio. He began his career with the product service division and specialized in service policies and procedures.

When the department was moved to Bridgeport in 1939 he was assigned as a range specialist, supervising all activities of field service programs, acting as liason man between factory and field and devoting much of his time to writing and editing range service publications.

Lloyd G. Hertzler has been appointed sales manager of General Electric's home laundry equipment division, manager **John M. Wicht** announced recently.

Hertzler's promotion to his new position follows an extensive selling and sales promotion career with G-E. From 1939 until the war curtailed the production of peacetime appliances he was sales manager of the vacuum cleaner division.



L. M. Smith Named Public Relations Director

Lewis M. Smith, (right) who started to work with the Alabama Power Company by way of Dixie Construction Company as a draftsman twenty-one years ago, was appointed director of the Public Relations Department by President Martin on September 1. For the past year Mr Smith has been associated with Mr. Martin in the work of the Committee for Economic Development and has done a job which has won much favorable comment. Immediately preceding the assignment to the CED work, Mr. Smith was chief electrical engineer. Prior to that time he was electrical engineer specializing in lines and substations. He spent a brief period with Allied Engineers in charge of line engineering and substation design.

In his new work Mr. Smith will keep in touch with professional, technical and scientific societies, and will encourage proper representation therein from the personnel of the Company in order that the Company may be informed at all times of advances in the sciences and the arts which have to do with the public services rendered by the Company. He will also keep in touch with civic bodies in the area served by the Company, to enable the Company to keep abreast of the social and industrial devlopment of the State, to the end that it may be a more useful instrumentality in the development of the territory served.

As public relations director Mr. Smith has supervision of the Advertising Department whose functions remain the same.

In the picture Mr. Smith is seen discussing one of the Company's advertisements with advertising manager Clarence Kilian.

FOR SAFETY'S SAKE . . . USE CONDUIT *(Full Weight Rigid Steel)*

Youngstown Buckeye Conduit used in the Chicago Subway

ONLY the sure, lasting protection of full-weight, rigid steel conduit is good enough for the wiring of the new Chicago Subway. This job took over a million feet of Youngstown Buckeye Conduit.

Wherever a wiring system needs adequate protection against water or moisture or vapors, dust and dirt, vibration and possible explosions, there is no dependable substitute for steel conduit. This fact is recognized in the National Electrical Code.

For years, owners, contractors and dealers have depended on Youngstown Buckeye Conduit--knowing that it provides the best and cheapest insurance against hazards, trouble and expense.

BUCKEYE YOUNGSTOWN CONDUIT

YOUNGSTOWN

THE YOUNGSTOWN SHEET AND TUBE COMPANY

YOUNGSTOWN, OHIO

Manufacturers of

CARBON . ALLOY AND YOLOY STEELS

Ask your distributor for: Youngstown Buckeye Conduit . . . Pipe and Tubular Products . . . Sheets . . . Plates . . . Electrolytic Tin Plate . . . Coke Tin Plate . . . Bars . . . Rods . . . Wire . . . Nails . . . Tie Plates and Spikes

A GREAT NEW LINE O
K
Kelvinator

NE OF REFRIGERATORS!

A most important answer to—
WHAT'S AHEAD AT KELVINATOR?

In the great postwar refrigerator market to come, Kelvinator retailers can look forward to this:

—In the first postwar models—to achieve maximum production as quickly as possible for Kelvinator retailers—there will be few changes. But these changes will be important ones . . . incorporating as many improvements for better food preservation as is possible in present cabinet styles.

—Later, a completely NEW postwar line of refrigerators incorporating a startling new conception of home refrigeration will be announced. Soundly engineered, brilliant new ideas in frozen storage facilities and high humidity cabinets can be expected.

In addition:

—A genuine Selective Dealer Policy that means *more sales and profits per dealer.*

—A "retail-minded" merchandising program designed to give new impetus to Kelvinator's outstanding pre-war successes . . . a program to enable Kelvinator and Kelvinator retailers to work even closer together than ever before in attaining a common goal of *more sales per dealer.*

Here is the cornerstone in the Kelvinator retailer's great postwar opportunity to build a sound, highly profitable, long-term business future.

Kelvinator's plans for getting Kelvinator Refrigerators into homes and on utility power lines as quickly as possible after victory are only one part of Kelvinator's overall program to get Kelvinator Refrigerators, Electric Ranges, Home Freezers and Electric Water Heaters in the home—where they will help build the greatest domestic load utilities have ever experienced.

LOOK AHEAD WITH KELVINATOR

DIVISION OF NASH-KELVINATOR CORPORATION

Kenosha • Milwaukee • DETROIT • Grand Rapids • Lansing

The reconstruction of General Electric's administrative and sales set-up of the appliance and merchandise department continues with the announcement of three new appointments, plus the realignment of the traffic appliance divisions.

According to an announcement by **H. L. Andrews,** vice president in charge of the A.&M. department, the traffic appliance divisions are separated into heating device and fan divisions, and the clock division. Simultaneously Andrews announced the engineering, manufacture and sales of sunlamps, heat lamps, heating pads and electric heaters of the plug-in type were transferred from the heating device and fan divisions to the pioneer products division.

Andrew's announcement stated that **M. B. Ross,** formerly sales manager of the traffic appliance divisions, was made manager of the heating device and fan divisions; **R. O. Fickes,** formerly in traffic appliance sales, was appointed to the post of manager of the clock division.

Other announcements included the appointments of **George E. Mullin, Jr.,** as sales manager for the electric sink and cabinet division, **R. E. Boian,** sales manager of heating devices, and **C. R. Thorson,** sales manager of clocks.

* * *

Three appointments in the electrical department of the Allis-Chalmers Manufacturing Co., Milwaukee, Wis., were announced recently by **R. S. Fleshiem,** department manager.

F. C. Ludington was named assistant to **W. S. Edsall,** manager of the switchgear and control sections of the electrical department. Ludington has been with the company for 21 years and was previously employed by the Cutler-Hammer Co. in its engineering department.

J. S. Morgan, who started with Allis-Chalmers as a member of the graduate training course in 1935, was appointed sales engineer-in-charge of switchgear sales, the position formerly held by Ludington. Morgan is a graduate of Purdue university.

W. M. Pickslay was named assistant engineer-in-charge of the control section of the electrical department. A graduate of Lehigh university, Pickslay entered the employ of Allis-Chalmers in 1929.

NEW EQUIPMENT and MATERIALS

UNIVERSAL IRONS

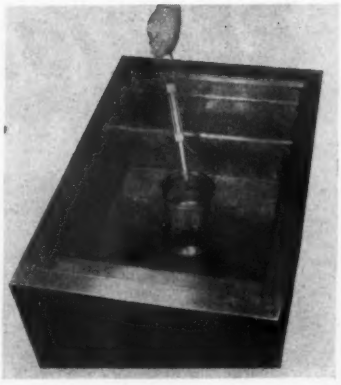
Landers, Frary & Clark, manufacturers of the Universal line of products is manufacturing two automatic types of irons under the recent OPA and WPB rulings.

The Universal Glider Iron No. 0184, manufactured in black baked lacquer top deck with white porcelain enameled cap and chromium plated sole plate and featuring exclusive air ports which protect the hand from rising heat contains a six foot permanently attached cord. Weighing four pounds, this iron also contains finger tip control giving accurate heat adjustment for every fabric, a new solid heel rest which forms an excellent foundation, a well rounded sole plate which presents wrinkling of fabrics on the backstroke.

The Wrinkle Proof automatic iron No. 0174 with fingertip control, wrinkle proof round heel contains round solid heel, beveled point, bakelite handle and is light weight. This model comes in baked black lacquer top deck, black porcelain enameled cap. Shipments are now being made to Universal accounts on an allocation basis.

HOTPOINT FRY KETTLE

A new Hotpoint-Edison automatic electric fry kettle, especially suited to the needs of large restaurants, hotels and institutions, designed to increase work capacity approximately 40 per cent, yet to sell at 32 per cent less than former model, has been announced by Grant Call, manager commercial cooking equipment sales division, Edison



General Electric Appliance Company. Special interest was shown in this post war product, which was shown at the National Restaurant show at Chicago, in October, because it evidences an equipment trend by which greater efficiency is possible at lower operating cost, according to a concensus of commercial operators who viewed it. The notable features of the K46 include: sediment well permits removal of sediment without draining kettle; less fat used, assures quick preheating, 400°F in 15 minutes, rapid recovery; dual basket supports, front support for convenient loading, rear support for aisle-free draining and storing .

I-T-E BULLETIN

"Keeping Air Circuit Breakers in Trim" is the title of Bulletin No. 4408, recently published by the I-T-E Circuit Breaker Co. An air circuit breaker, like any other machine, performs better and lasts longer when given a reasonable amount of care. "Breaker won't stay closed?" — "Contact impression? What's that?"—"How much oil in the time-delay cups?"—are only a few of the questions answered. This new eight page booklet, written to help men who are responsible for air circuit breakers, may be obtained by writing to: The I-T-E Circuit Breaker Co., 19th & Hamilton Sts., Philadelphia 30, Pa.

BULLDOG WILL SPEED RECONVERSION

All industry, during the war, has learned that good lighting pays for itself many times over — in bigger output, better work, less spoilage, and employee health.

Plants equipped with BullDog Universal Trol-E-Duct will find its advantages multiplied in the reconversion period, and in the peacetime competitive race to come.

It is the only system that provides completely flexible lighting. It brings lights close to the work — permits you to add new lights or re-locate present ones, instantly and wherever needed.

Expert BullDog engineers are ready to help you now in your postwar preparation. Write for information about BullDog Universal Trol-E-Duct and its companion systems — BUStribution DUCT for flexible power and Industrial Trol-E-Duct for portable tools, cranes, hoists and other moving loads.

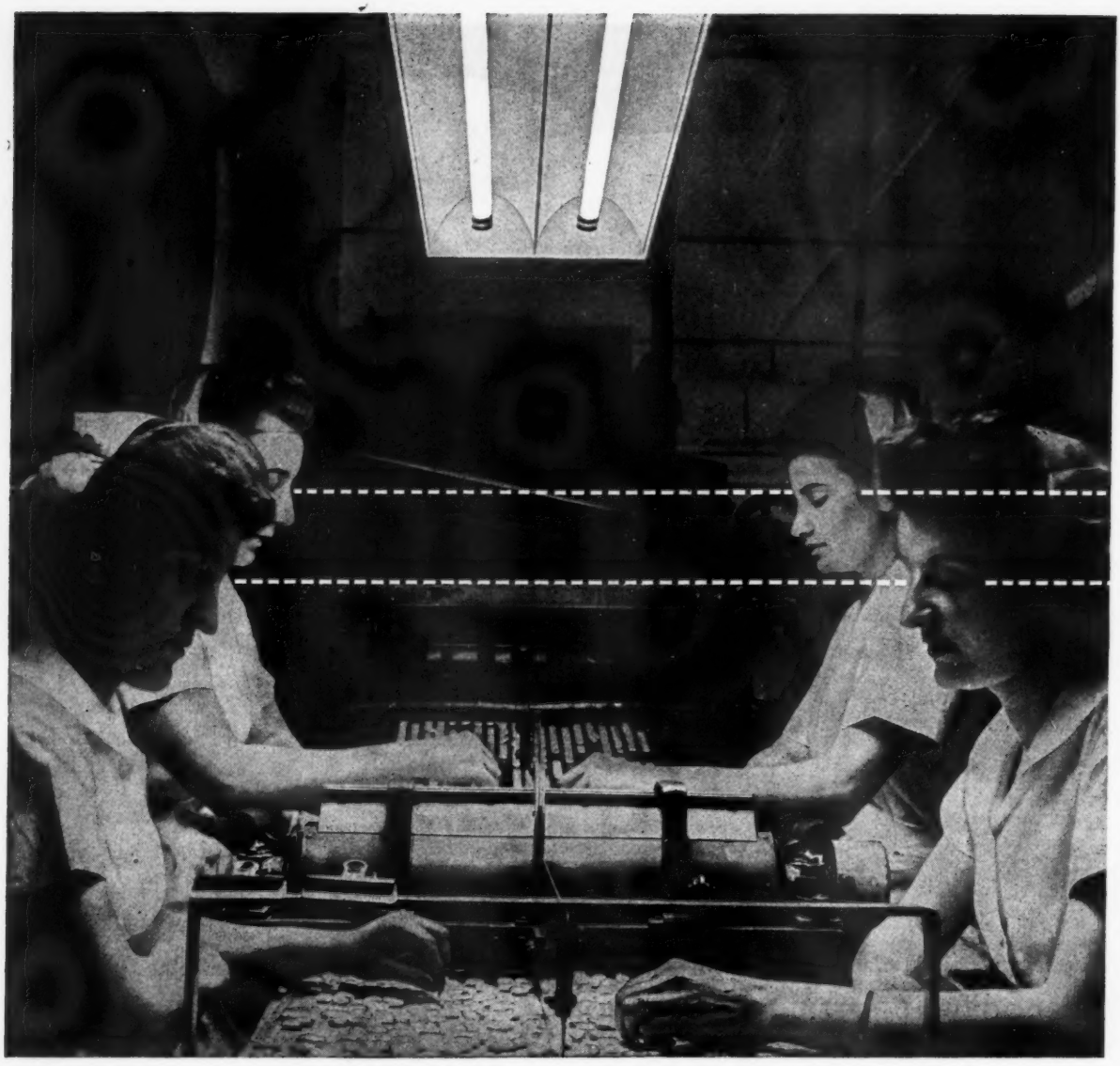
Any type of light can be suspended from Universal-Trol-E-Duct — the Duct serving as both support and feed. Trolleys or Plugs inserted in the Duct convey current from the Duct to the lighting fixtures.

BULLDOG
ELECTRIC PRODUCTS CO.

BOX 177, R. PK. ANNEX
DETROIT 32, MICHIGAN
BullDog Electric Products of Canada, Ltd., Toronto, Ont.

Field Engineering Offices in All Principal Cities

ALSO MANUFACTURERS OF
VACU-BREAK SAFETY SWITCHES • SWITCHBOARDS • SAFTOFUSE PANEL BOARDS • CIRCUIT MASTER BREAKERS • UNIVERSAL TROL-E-DUCT • INDUSTRIAL TROL-E-DUCT.



HELP SHORTEN THE WAR...BUY MORE BONDS THAN BEFORE!

TOMORROW...

Tomorrow, lamps and light will serve America in new ways, new forms, new places. Westinghouse Mazda Lamps in new shapes and colors, along with new techniques in lighting, will open up a whole new field of decoration and display for the store owner. And Westinghouse Sterilamps—already widely applied by laboratories and food and drug manufacturers to reduce contamination from air-borne bacteria — will be used in homes, schools and public buildings to lessen the risk of infection and help bring safer, more healthful living.

THESE EYES

---

must watch a parade of millions

★ Cool, soft, eye-easy light from Westinghouse Mazda Fluorescent lamps enables these four inspectors to scan millions of gleaming white pieces of gum in a day. And with See-ability to aid their search for blemishes or defects, not one in a hundred thousand pieces gets by! See-ability helps workers do a better job—faster, more efficiently. Under See-ability conditions, mistakes are fewer, accidents reduced, materials saved, inspection speeded. And See-ability is welcomed by employees, too. For it lessens eye-strain and fatigue, promotes health and well-being. With the end of the war, will come new and bigger demands for See-ability in factories, stores, offices and homes. Whether you are modernizing existing installations or planning new ones, be sure to give your customers the advantage of See-ability with bright, long lasting Westinghouse Mazda lamps. Westinghouse Electric & Manufacturing Company, Bloomfield, New Jersey.

Westinghouse

PLANTS IN 25 CITIES OFFICES EVERYWHERE

MAZDA LAMPS FOR SEE-ABILITY

WESTINGHOUSE PRESENTS JOHN CHARLES THOMAS • SUNDAY 2:30 EWT., N.B.C.
TED MALONE • MONDAY, WEDNESDAY, FRIDAY, 10:15 EWT., BLUE NETWORK

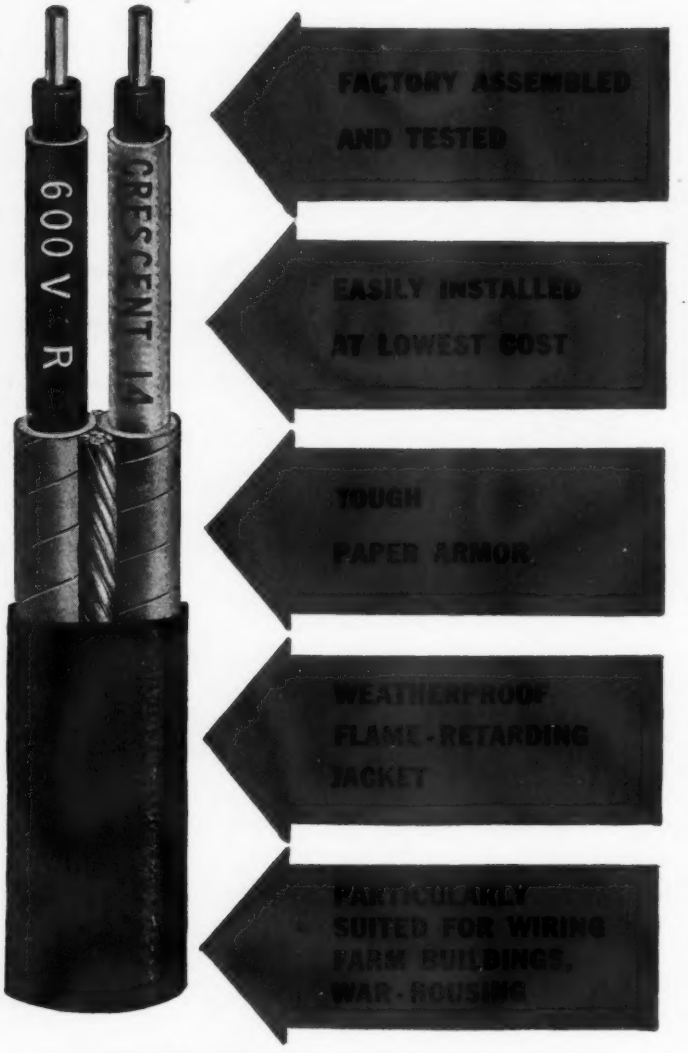
● IMPERIAL NEOPRENE JACKETED PORTABLE CABLES ●

CRESFLEX

NON-METALIC SHEATHED CABLE

● BUILDING WIRE ● SERVICE ENTRANCE CABLE ● CRESFLEX NON-METALLIC SHEATHED CABLE ● ARMORED CABLE ●

● PERMACORD ● LEAD-ENCASED AND PARKWAY CABLES ● SYNTHOL WIRES ● WELDING CABLES ● SHIPBOARD CABLES



CRESCENT

WIRE and CABLE

NEMA

CRESCENT INSULATED WIRE & CABLE CO.

TRENTON, N. J.

SOUTHERN REPRESENTATIVES

ATLANTA, GA.
Edgar E. Dawes
312 Rhodes Bldg.

NEW ORLEANS, LA.
Paul Hogan, Jr.
823 Perdido St.

DALLAS, TEXAS
M. C. Huie Co.
707 Thomas Bldg.

RUBBER POWER CABLES ● VARNISHED CAMBRIC CABLES

AUTOMATIC CLOTHES DRYER

Announcement of the Hamilton Automatic Clothes Dryer, to be sold nationally after the war, has been made by the Hamilton Manufacturing Company, Two Rivers, Wisconsin.

The Hamilton Automatic Clothes Dryer works on a simple, efficient operating principle that assures speedy and economical performance. You just snap on the switch to start the dryer, and toss in the clothes which revolve by slow, gentle tumbling action in the clean, warm air. In a few minutes they are taken out . . . soft fluffy, sweet smelling.

The Hamilton Dryer damp-dries (ready to iron) average washer load of clothes in 15 to 25 minutes. Complete drying takes slightly longer. It holds a maximum washer load of 9 pounds of dry clothes . . . and up to 18 pounds of wet clothes in one load. Automatic thermostat shuts off heating element, making it imposssible to damage clothes.

MITCHELL CATALOG

A new colorful catalog has just been issued by the Mitchell Manufacturing Company, of Chicago, illustrating and describing the complete new Mitchelite line of all-steel industrial fluorescent fixtures.

This new catalog, No. 281, gives complete data and information on new 2-40 watt, 3-40 watt and 2-100 watt models with steel reflectors and wireway channels — open-end and closed-end types — including new perfected "instant-start" units —in baked enamel or porcelain enamel finish. Also illustrates and explains the new Mitchell Aircraft-type "Instant Latch" for quick, easy release of reflector.

Just around the corner too..

Your Future AS A PREMIER DEALER!

Advertisements of the type shown above are appearing in The Saturday Evening Post, Ladies' Home Journal and Good Housekeeping.

Before very long "reconversion" will be much more than a catch-word to you—you and your business will actually be going through it! You'll be converting into new appliance sales the good-will you've built up through wartime service.

But what will you be selling? Your future depends upon your answer to that question! It depends, too, upon quick action now in arranging franchises for the electrical appliances that will bring you success after victory.

Premier's policies have already been established—Premier's distributors from coast to coast have already been announced—Premier production will soon begin—Premier's national advertising is already at work building future business. Will you be ready to get your share of Premier sales?

Get in touch with the distributor who will serve you—or write us.

Ask for the new booklet, "Your Future as a Premier Dealer," if you haven't already received your copy.

GUARANTEED CERTIFIED SERVICE For Vacuum Cleaners

ARMY E NAVY

PREMIER

DIVISION

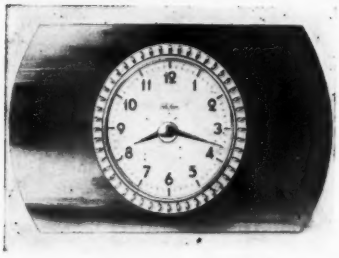
ELECTRIC VACUUM CLEANER CO., INC.

CLEVELAND 10, OHIO

Actual photographic reproductions are used to show how easily Mitchelite accessories provide for every modern method of hanging or mounting these fixtures. These Mitchelite fixtures are U. L. and E. T. L. approved throughout, and are available through leading electrical wholesale distributors. For a copy of the new Mitchell Catalog No. 281, write to the Mitchell Manufacturing Company, 2525 Clybourn Ave., Chicago 14, Illinois.

RADIO TIMER

A low cost timer that pre-selects any program on a given band, and turns the radio on and off, is one of several new items with which Warren Telechron Company has resumed production of clocks and timing devices under its own name, according to Roy W. Johnson, general sales manager.



Recommended especially for moderately priced receivers, the new Telechron radio timer is completely automatic, has a large, legible dial, visible from any part of the room—and no gadgets to confuse the housewife or get out of order. The self-starting Telechron motor is of the sealed-in, reservoir type; there are no knobs to turn and no difficult calculations to do.

A flick of the fingers sets the keys around the clock face. Since each of the 48 keys indicate 15-minute time intervals, settings can be made as long as 10 hours in advance. The keys are automatically set to "off" after timing periods are passed.

SILEX STEAM IRON

A radical departure in steam irons, and one that the trade has long been waiting for, is the new Silex automatic electric steam iron. This revolutionary iron differs from any other steam iron on the market in that it distributes a horizontal sheath of steam over the entire ironing surface. Which means that the Silex iron gives

complete all-over steam protection. Actually the iron moves on a cushion of steam extending from the tip to the heel of the iron. Wherever the iron touches the fabric this layer of steam prevents scorching, sticking, melting.

This all-over steam protection is made possible by an exclusive feature developed by Silex engineers—3-way grooves on the iron sole plate, through which the steam is forced horizontally—not downward. Not only is this 3-way groove feature important to the customer as her guarantee of steam protection every inch of the way, but it's a sure-fire trade-mark for the dealer, for no other iron is so constructed.

A second feature is a special lever which allows a woman to change from steam to dry heat instantly, or vice versa, while she is ironing. This means she can iron her husband's shirt with steam and flip to dry heat for a professional, glossy finish on cuffs and collar. In addition to these unusual steam-iron innovations, the Silex iron has all the features of the most modern automatic electric iron. This makes it possible to call it "two irons in one."

WIREMOLD BOXES

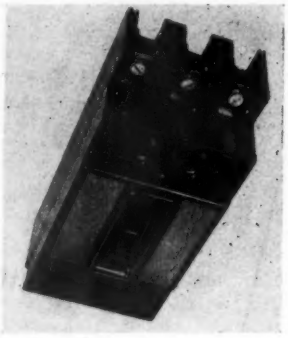
The Wiremold Company, Hartford, announces that all their switch and receptacle boxes are now provided with clearance holes for screws used in mounting Uniline, Despard, and similar plates to the Wiremold boxes.

NEW "DE-ION" BREAKER

A new 100-ampere "De-ion" circuit breaker which requires less space and permits lighter structures for distribution panelboards built-in applications and bus duct plug-ins is announced by Westinghouse Electric and Manufacturing Company.

All ratings are available in one compact breaker with uniform pole spacings and terminal arrangement, providing complete interchangeability between ratings. The new F Frame permits for the first time a 100-ampere, 600-volt a-c or 250-volt d-c breaker in the same space formerly required by the 50-ampere, 600-volt a-c or 250-volt d-c rating.

Equipped with thermal and instantaneous magnetic trip elements, the "De-ion" fuseless circuit breaker permits maximum loading of circuits and fast resumption of interrupted service. Contact pressure increases with wear, thereby prolonging the life of contacts and



breaker. Silver alloy contacts give increased contact life with lower wattage loss. The special alloys used also prevents "freezing". Both two and three-pole units are available.

Further information concerning the F Frame 100-ampere breaker may be secured from P. O. Box 868, Westinghouse Electric and Manufacturing Company, Pittsburgh, 30, Pa.

IMPREGNATING VARNISH

An impregnating insulating varnish for all types of electrical windings, which meets United States Army Signal Corps requirements, is announced by John C. Dolph Co.

Unlike the conventional surface protective coating, PG-4-FC Clear Baking Varnish protects each layer of wire. Therefore, if the surface of the winding is damaged in rough handling, the fungicidal protection of the PG-4-FC Synthite Clear Baking Varnish is still retained.

Curing of PG-4-FC Synthite Clear Baking Varnish takes place through heat induced chemical polymerization which brings about complete solidification of the entire mass. This type of curing eliminates the possibility of wet spots in the interiors of windings.

Report on

NATVAR #400

a New Extruded Plastic Tubing

Excerpts from the E.T.L. report covering tests made on Natvar No. 400 in accordance with A.S.T.M. Standards.

DIELECTRIC STRENGTH — A.S.T.M. D350-43
Average volts per mil: At 28°C — 1090
At 85°C — 700
Wall thickness: .0235"

DIELECTRIC CONSTANT AND POWER FACTOR
Dielectric constant at 29°C and relative humidity 60%
At 60 cycles: 8.15
At 1 megacycle: 4.35
Power Factor: At 60 cycles: .056
At 1 megacycle: .064

ARC RESISTANCE — A.S.T.M. D495-42
Average — 135 seconds

OIL RESISTANCE — A.S.T.M. D295-43T
"Turbol 10" at 105°C was used. After 15 minutes immersion there was no apparent change in the tubing. After 24 and 48 hours there was no sign of change in the tubing. Three separate tests were made.

HEAT ENDURANCE — A.S.T.M. D350-43
After 7 days at 125°C the tubing did not crack or otherwise fail when bent 180° around a $\frac{5}{16}$" mandrel.

TENSILE STRENGTH AND ELONGATION
At 200% elongation: Average 1980 lbs. per sq. in.
At Maximum: Average 2870 lbs. per sq. in.
Total elongation: 350%

LOW TEMPERATURE FLEXIBILITY
After 3 hrs. at minus 30°F specimens were bent around a mandrel $\frac{5}{16}$" in diameter. There was no sign of cracking or other failure.

FLAME RESISTANCE — D350-43
Burned about ¼ in. in 10 to 15 seconds and then went out. Three tests were made.

EFFECT OF CHEMICALS
Effect of 7 days immersion in solvents at room temperature; average of 3 tests in each solvent:

Solvent	Change in weight Per cent of weight of specimen as received	Change in dimensions Per cent of dimensions of specimen as received Length	Outside diameter	Thickness
5 per cent sulfuric acid	+ 0.41	none	none	none
1 percent potassium hydroxide	+ 0.83	none	none	none
Petroleum	+ 6.62	+2.6	none	none
Ethyl Alcohol	+ 1.66	none	none	none
Benzol	+21.9	+6.6	+10.9	−24.0

WATER ABSORPTION
Average of 5 tests

Water absorption, per cent by weight of dry specimen	0.63
Soluble matter, per cent by weight of dry specimen	0.01
Total water absorption, per cent by weight of dry specimen	0.64
Change in dimensions: in length	none
in outside diameter	none
in thickness	none

This new tubing is now commercially available for war uses. For further information, write, wire or phone us.

THE NATIONAL VARNISHED PRODUCTS Corporation

TELEPHONE RAHWAY 7-2171
CABLE ADDRESS NATVAR: RAHWAY, N. J.
227 RANDOLPH AVENUE ★ WOODBRIDGE NEW JERSEY

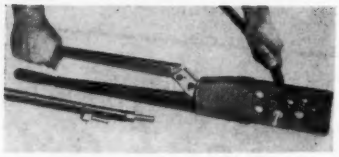
11-NVP-4

The degree of hardness can be controlled by altering the baking time and temperature. Although this varnish solidifies completely in a relatively short period of time, a longer bake will produce a finish which is extremely hard.

Synthite PG-4-FC Clear Baking Varnish is adaptable for use on the modern types of polyvinyl acetal coatings of magnet wire. Then too, because of its excellent heat dissipating properties, it is used on glass insulation which is recommended for units having high temperature rises.

CONNECTOR TOOL

A new Hytool just announced by Burndy Engineering Co., 107 Bruckner Blvd., New York 54, N. Y., simplifies the installation of Hyseal Thimbles used on Navy, insulated, electrical cable. The Burndy Hyseal Thimble, with which this new tool is used, is the integral combination of the Navy thimble and a shroud for sealing the end of the cable. When this shroud is compressed a seal is



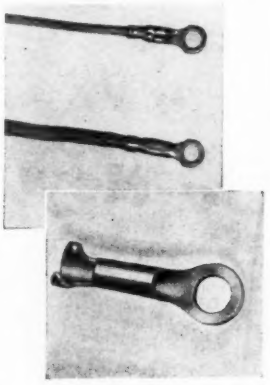
formed, which prevents the entry of water even under high pressure.

This new Hytool, illustrated here, eliminates the necessity of a separate pair of dies for each thimble size such as is required in hydraulic presses. The "spade" of the new tool carries a series of holes or "dies" which provide for the installation of a number of thimble sizes, so that no parts have to be changed. One stroke of the handle completes the watertight sealing operation. Two sizes of the new Hytool are available.

SOLDERLESS TERMINAL

An unusually simple and easily installed solderless terminal has been developed by the H. B. Sherman Mfg. Co., of Battle Creek, Mich., for all small wire connections such as aircraft, radio, other electronics, switchboards, automotives, etc.

Known as the "Uni-Crimp," this new terminal is fully interchangeable with other terminals of this type, and lends itself to rapid assembly in production. It can be installed with hand crimping pliers, or standard types of indenting dies. As shown in the illustration, two indentations across the barrel of the terminal attach it permanently to the wire.



"Uni-Crimp" terminals are made from pure copper, correctly tempered, and are of one-piece construction, with insulation support wings. With the one-piece construction there are no parts to come loose during handling or under severe vibration.

Three styles of "Uni-Crimp" Terminals are currently offered to the trade: No. UC-18-B, for Nos. 18, 20 and 22 gauge wire; No. UC-14-B, for Nos. 14, 16, and 18 gauge wire; and No. UC-10-B, for Nos. 10 and 12 gauge wire. Write for Bulletin No. UC-2.

TRANSFORMER BULLETIN

A new 56-page booklet, "Instrument Transformer Accuracy Standards," has recently been made available by the General Electric Company. It is a two-part booklet. The first part explains the ASA accuracy standards for potential and current transformers and shows how they differ from the NEMA standards. Several tables and graphs simplify the use of Part 1 in respect to classifying transformers for accuracy, evaluating the effects of transformer errors on meter readings, and explaining the significance of accuracy classes and burdens.

The second part of the booklet consists primarily of a handy guide for the selection from a

DON'T LET THIS HAPPEN TO YOU
Protect the safety of your customers and their equipment by recommending the installation of FLUR-O-LOCKS for fluorescent lamps as a protective measure against falling lamps due to vibration or improper installation.
FLUR-O-LOCKS tends to increased efficiency of lamp, starter and ballast—are economical and easy to install.
FLUR-O-LOCKS keep lamp equally spaced between sockets and in good electrical contact . . . May save you the expense of a damage suit. Sold and warehoused by leading distributors.
Flur-o-Locks by
LADUBY COMPANY
178-180-182 OAK ST., NEW HAVEN 11, CONNECTICUT

complete line of standard indoor and outdoor current and potential transformers. It contains approximately 60 illustrations of the transformers with prices, ratings, and ASA and NEMA accuracy classifications for each type.

Complete information on the selection of instrument transformers is available in this well-illustrated booklet, GEA-4240, available upon request from the General Electric Company, Schenectady 5, N. Y.

VOLTAGE TESTER

A voltage tester that tests without lamps, gives positive voltage identification and distinguishes between a-c and d-c is offered by Square D Company, 6060 Rivard St., Detroit 11, Michigan.

A-c voltage markings are 110, 220, 440 and 550. D-c markings are 125, 250, and 600. Frequencies can be determined by the vibrations of the indicator. The device is housed in a cylindrical fibre case, for easy gripping, and is practically unbreakable. The 4" fibre grips on the leads give complete insulation and leads are 24" flexible wire, with double thickness, rubber insulation vulcanized to the wire to prevent slipping. A peg and spring assembly prevent sharp bending and breaking of leads where they enter the case. Sharp spear points on the ends of the leads permit piercing of wire insulation for testing without damaging it. A free folder (CA-504) is available by writing the Square D Company.

FLAMENOL LEAD WIRE

A new Deltabeston Flamenol (*Reg. U. S. Pat. Off.) thermoplastic insulated lead wire for use in all types of fluorescent lamp ballasts is announced by General Electric's appliance and merchandise department. This new lead wire is approved by the Underwriters' Laboratories for use as lead wire in lighting fixtures wherever 600-volt service is required.

STARCH VS. VARNISH

The first thing to look for when selecting a varnished cloth is the degree of sizing. The more starch used in the sizing process, the less varnish there will be in the finished product — and it's the varnish that insulates, not the starch. G-E varnished cloth contains minimum sizing and maximum varnish impregnation. Heavy sizing produces a "slick" appearing cloth — one that looks "nice". Minimum sizing helps produce a cloth with high dielectric strength, power factor, resistance to moisture, excellent heat aging and long shelf life.

DEGREE OF VARNISH HARDNESS

Next consider the varnish—particularly its degree of hardness. The ideal varnish must be soft enough to retain maximum flexibility and to delay stiffening; yet hard enough to withstand abrasion where it may be encountered.

For additional details consult your local G-E Distributor or write: Section RIM-1141-16, Resin and Insulation Materials Division, General Electric Company, Schenectady 5, N. Y.

BUY WAR BONDS AND KEEP THEM

Hear the General Electric radio programs: "The G-E All Girl Orchestra" Sunday 10 p.m. EWT, NBC. "The World Today" news every weekday 6:45 p.m. EWT, CBS.

GENERAL ELECTRIC

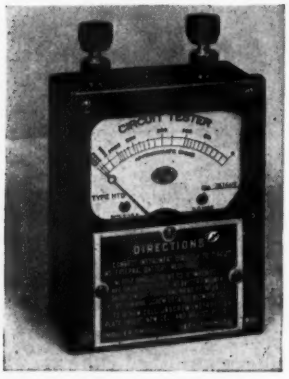
It is approved for 176 deg. F.

The insulation of this new wire is superaging and is resistant to flame, oils, acids and alkalies. This wire is available in solid and stranded conductors, sizes 16 and 18 AWG in brilliant colors, including black, white, red and green.

Deltabeston Flamenol lead wire is mechanically strong and flexible. It will not rupture when bent and is free stripping, easy to splice and terminate.

CIRCUIT TESTER

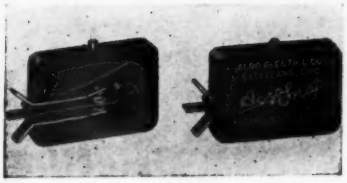
This compact, light weight Roller-Smith Circuit Tester is used to determine the resistance of an electrical circuit with the scale reading directly in ohms. It is furnished in a range from 0-10,000 ohms and can



also be furnished with 2 ranges—0-5,000 and 0-50,000 ohms—HTD—3 Type. The instrument is extremely compact and measures 4½ x 3 x 1½" with a weight of but 10 ounces. It consists of a small high grade d'Arsonval type D. C. voltmeter connected in series with a standard flashlight battery. Terminals are provided for connecting to the circuit under test. The removal of plate on front permits easy replacement of dry cell and also gives access to internal zero adjuster. Details available in catalog 123-b from Roller-Smith Co., Bethlehem, Penna.

MINIAC SNAP-SWITCH

Small in size for a fully enclosed snap-action switch, the new Miniac is only 17/64" thick, 13/16" high, and 1-3/16" long. Engineered on the well-known rolling spring principle, but with a new design and smaller size. Fully enclosed in a bakelite case with four mounting holes 3/32" diam. Actuation is with a stainless steel pin plunger. All parts are non-corrosive and all contacts are of fine silver. Main blade, contact



blade, and rolling spring made of beryllium copper. Rated at 15 amps., 115 volts A.C. Furnished in single pole, normally open and normally closed, double throw. Designed to permit leaf type or over-travel plunger type actuators to be attached to the case. Manufactured by the Acro Electric Co., 1365 Superior Ave., Cleveland 14, Ohio.

LAMP STARTER

Improved design to assure faster starting with adequate cathode-preheating, both essential to increased fluorescent lamp life, is featured in a gas-actuated starter called the "Glostat FS-5", for 4-, 6-, and 8-watt fluorescent lamps, recently announced by Sylvania Electric Products, Inc. of Salem, Massachusetts.

Starter contacts, which are normally open, are enclosed in a low-pressure argon gas atmosphere. The stationary contact consists of a rectangular metal "flag" to assure good electrical make and break with a short silver bar spot-welded to the movable bimetal element. When the line switch is closed, the argon gas glows and heats the bimetal element which momentarily closes the circuit to pre-heat the lamp cathodes.

Closing of the starter contacts also eliminates the gas glow in the starter so the movable element can cool and return to its normal position and permit the establishment of the arc in the fluorescent lamp. The voltage drop across the lamp prevents recycling while the lamp is in operation. Other Glostat models include the FS-2 for 15- and 20-watt, and the FS-4 for 30- and 40-watt lamps.

SOLA TRANSFORMER

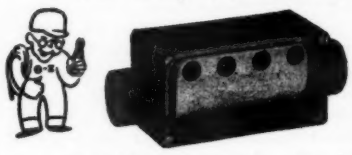
A small, compact, hermetically sealed Sola Constant Voltage Transformer for through-chassis mounting, has been designed for such applications as heating and refrigeration controls, television and FM receivers, vacuum tube volt-meters, electronic gauging and inspection equipment, photo-metric instruments and other similar applications where precisely regulated supply voltage is mandatory. At any reasonable transformation ratio of input to output it will provide a single output voltage constant to within 1% of rated requirements regardless of line voltage variations as great as 12 to 15%.

Capacities up to 15 VA, 60 cycle operation, are available and are supplied with a separate capacitor unit for external mounting. This transformer has no moving parts, requires no manual supervision or adjustments and is self-protecting against short circuit. Sola Bulletin No. CV-106 gives complete electrical and mechanical specifications. Sola Electric Company, 2525 Clybourn Avenue, Chicago 14, Illinois.

ORANGEBURG CONDUIT

The Fibre Conduit Company, Orangeburg, N. Y. has issued a new catalog on Orangeburg Conduit. Consisting of 20 pages, the catalog contains much helpful information and gives complete data and specifications on Orangeburg Standard

NO SOLDER . . .
NO TAPE . . .
NO LOOSE CONNECTIONS
with O.Z.
two-way connectors



—for joining two same size cables, end to end, in a straight line.

O. Z. Two-Way Connectors are designed for *positive contact, ease of installation, accessibility for maintenance,* and *salvageability of both connector and cover.* This fitting, with cover made of canvas Bakelite, makes a neat compact connection of high mechanical and dielectric strength. Available with and without cover for cable sizes from No. 8 to 2000 Mcm.

The O. Z. Catalog, No. 125, gives many helpful "Facts about Fittings" and tabulated sizes, prices for: *Conduit Fittings—Cable Terminators—Junction Boxes—Solderless Connectors—Power Connectors—Grounding Devices.* A letterhead request will bring your copy.

7055

O.Z ELECTRICAL MFG. CO.
262 BOND STREET · BROOKLYN, 2 N. Y.

Represented by: M. W. Whitman, 313 Bona Allen Bldg., Atlanta 3, Ga.; W. J. Keller, 304 Natchez Bldg., New Orleans 12, La.; F. B. Ostermueller, 6935 Meadow Lake Ave., Dallas 14, Texas.

Conduit for installation with concrete encasement, and Orangeburg Nocrete Conduit for installation without concrete encasement.

Orangeburg Conduit has been used for more than 50 years for housing electric cables installed underground. Made of cellulose fibre vacuum impregnated with coal tar pitch, Orangeburg ducts do not corrode.

Copies of the new catalog will be supplied on request for Catalog No. 49, addressed to James R. Connell, vice president, The Fibre Conduit Company, 292 Madison Avenue, New York 17, N. Y.

New Electrical Books

Fields and Waves In Modern Radio

By Simon Ramo and John R. Whinnery. Published by John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y. 503 pages, profusely illustrated.

Written from an engineering viewpoint, this up-to-date book supplies the necessary electromagnetic theory essential for an understanding of modern radio and its related problems. It is devoted exclusively to fields and waves in present-day radio and should prove most valuable to practicing engineers, physicists, industrial radio engineers, and teachers of ultra-high frequency and physics.

An outstanding feature of the book is the fact that it correlates with conventional circuit theory the field and wave theory needed for radiation and microwave engineering. It provides a clear, thorough explanation of high-frequency circuits, skin effect, shielding problems, problems of wave transmission and reflection, transmission lines and wave guides, cavity resonators, antennas and other radiating systems.

Control of Electric Motors

By Paisley B. Harwood. Published by John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y. 479 pages, illustrated. Price, $5.00.

Engineers concerned with electric control will welcome this second edition of Harwood's comprehensive treatise on motor control. This second edition brings original material up to date and in-

BEAUTIFUL, EFFICIENT LIGHTING
WITH LOW SURFACE BRIGHTNESS

Curtis StarLux is a four-lamp pendant luminaire which is far ahead in beauty and effectiveness. Engineered-design and quality manufacture combine to guarantee many years of efficient trouble-free service. Scientific shielding and low surface brightness insure eye comfort. The maintenance man will like this fixture too—the glass panels can easily be removed for cleaning when necessary, but lamps and starters can be replaced without removing any glass.

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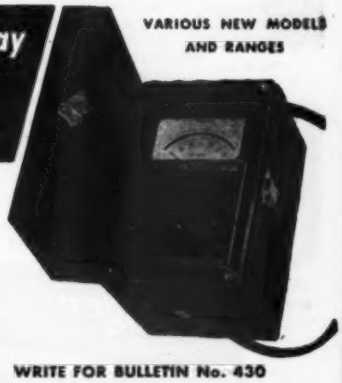

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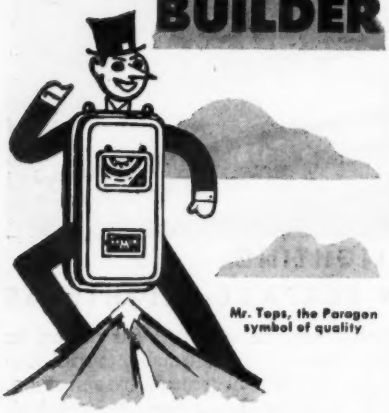
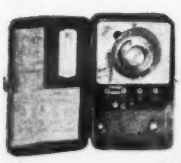


Mr. Tops, the Paragon symbol of quality



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The time cycle of Paragon synchronous motor operated, instantaneous reset, type relays is unaffected by vibration or changes in ambient temperature. For motor and tube protection.

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. . . are designed for presetting heating or ventilating schedules on a weekly basis with independent daily operations.

Manually Preset Timers

The 2500 series is designed to close or open a circuit at the end of a preset interval, such as attic fan control.

Send for complete bulletin. All these units are designed and built by a pioneer in the automatic timing field.

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Paragon Chicago
BUILDERS OF ELECTRICAL EQUIPMENT SINCE 1901

cludes additional data on variable voltage control, single phase motor control, synchronous motor control, present-day methods and devices for acceleration, and systems for main rolling mill drives.

The object of the book is to describe briefly the characteristics of various types of motors and to explain how these characteristics are used for control purposes. This one volume provides a general source of information for everyone working with electrical motors whether the interest is in design, installation, or operation. Problems frequently encountered, such as motor acceleration, dynamic braking, and resistor design, are discussed in detail. In this second edition, the arrangement of the book has been radically changed. Controllers are now described in the chapters covering the type of motor to which they apply.

Statement of Ownership

Statement of ownership, management, circulation, etc., required by the Act of Congress of Aug. 24, 1912, and March 3, 1933, of Electrical South, published monthly at Marietta, Georgia, for October 1, 1944.

State of Georgia, County of Fulton.

Before me, a Notary Public in and for the State and County aforesaid, personally appeared Carl W. Evans, who, having been duly sworn according to law, deposes and says that he is the Editor of the Electrical South, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication, for the date shown in the above caption required by the Act of August 24, 1912, as amended by Act of March 3, 1933, embodied in Section 537, Postal Laws and Regulations, printed on the reverse side of this form to-wit:

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Editor, Carl W. Evans, Atlanta, Ga.

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CARL W. EVANS,
Editor.

Sworn to and subscribed before me this 4th day of October, 1944.

SEBA J. JONES,
Notary Public at Large.

Radio License Examinations

By Charles E. Drew. Published by John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y. 320 pages, illustrated. Price, $3.00.

This revised second edition provides discussions and explanations of some 1,300 questions of the Federal Communications Commission study guide and is designed to help the reader in answering actual examination questions on radio laws, basic theory and practice, radio telephone, advanced radio telephone, radio telegraph, and advanced radio telegraph.

In addition, the appendix supplies excerpts from sources of radio laws, the International Morse code, a table of abbreviations, and essential miscellaneous data.

Production, Jobs and Taxes

By Prof. Harold M. Groves. Published by McGraw-Hill Book Co., Inc., 330 West 42nd St., New York 18, N. Y. Price, $1.25.

This book is the result of fourteen months of research and an-

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alysis by one of America's outstanding tax experts. Published under the auspices of the Research Committee of the Committee for Economic Development, it is the first of some twenty research studies now under way or projected, which when completed will constitute a two-foot shelf of books applying both specialized study and practical business experience to help in solving all the various transitional and long-term problems which will confront the national economy after the war.

This first book of the series has been praised by economists and financial specialists as a permanent contribution to tax theory—one that shoots a beam of white light through one of the most tangled of contemporary problems. It can safely be said that no discussion of federal taxation from now on can be conducted without reference to the proposals made by Professor Groves in this study.

To Check Your Lighting Under Wartime Conditions

(*Continued from page 24*)

may be taken care of by proper location and arrangement of the light source so that the reflected light travels away from the eyes.

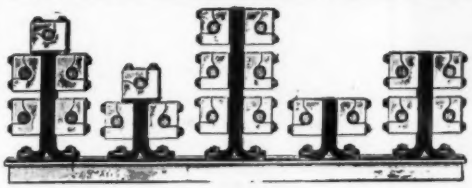
Specular reflecting objects or surfaces are sources of negative lighting. A 50 foot-candle installation may be reduced to give a 20 foot-candle seeing effect by permitting shiny objects or surfaces to remain accidentally in important positions.

It is also bad to let workers face sunlight, and usually this can be avoided by relocation of machines, benches or desks. The same principle of proper light distribution holds here. Wall areas adjacent to windows, and also window frames and sashes, should be light colored rather than dark.

Eyes are never still. They constantly move about the room. Each change in brightness causes them automatically to change their readaptation. This demands muscular effort. If this is too violent it is fatiguing. Variations in brightness should be made as small as possible.

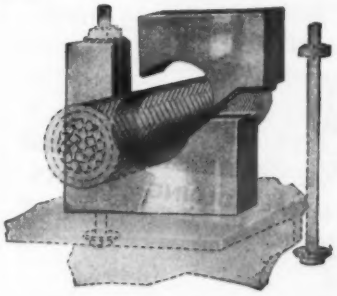
Light color paint on machines and surroundings, especially walls and floor, and even light clothes for the workers can do a lot to relieve excessive brightness contrasts.

"EFFICIENCY" DEVICES FOR CONDUIT AND CABLE SUSPENSION



EFFICIENCY NESTED CLEAT RACKS

● Simple . . . rigid . . . strong . . . features that have made EFFICIENCY Nested Cleat Racks the choice for efficient conductor mounting. The "nested" design permits cable suspension in a minimum space and at the same time speeds installation. A further aid to mounting convenience is the EFFICIENCY Time Saver Cleat, designed for use in conjunction with Nested Cleat Racks. Note, in the illustration, that the cleat is mounted permanently with one bolt, thus forming a solid support for the wire or cable. With this design the cable may be left to hang slack, or be drawn taut at the time of suspension. Using these units in combination *one man can install cable faster than two men with the usual type of cleats and racks.*



WRITE TODAY for our Catalog No. 388 . . . contains complete information on this and other EFFICIENCY Electrical Devices

Efficiency ELECTRIC AND MANUFACTURING CO.

MANUFACTURERS OF EFFICIENCY ELECTRICAL DEVICES FOR CONDUIT, WIRE AND CABLE SUSPENSION

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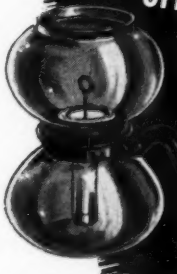

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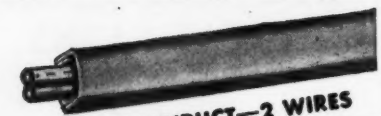
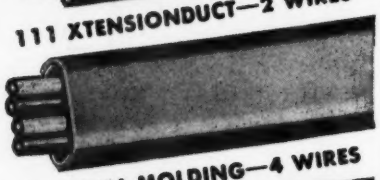
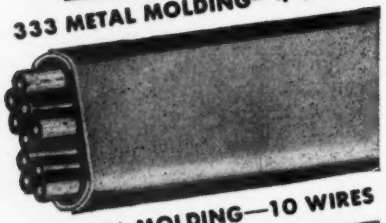


111 XTENSIONDUCT—2 WIRES



333 METAL MOLDING—4 WIRES



888 METAL MOLDING—10 WIRES

711-A FLORDUCT—3 WIRES

733-A FLORDUCT—TWO-26 PAIR

National Electric Surface Raceways for surface wiring are easily installed. They have a neat appearance and may be painted with either oil or water paints to match interiors. These raceways are securely fastened to all fittings. No screw connections necessary. Push tongue connection insures perfect permanent ground. Wires are laid in the base; the capping snaps on. No fishing or tearing up walls or floors.

Write for descriptive literature on "La-in" surface raceways.

Listed and approved by Underwriters' Laboratories, Inc.

National Electric Products Corp.
Pittsburgh, Pa.

Value of Floor Traffic Learned

(*Continued from page 19*)

"Take the field of lighting for instance, I look for a complete transformation within about five years with fluorescent fixtures taking the lead. In the heating field we have been selling stokers already and we will broaden out to include other electrically operated equipment in this field including blowers and controls. We will also sell attic fans.

"Suffice to say we will have plenty to sell in the way of new appliances after the war and we expect to sell them. For the first few years salesmanship won't play such a big part, as having the merchandise will be the chief requisite to a sale. For that reason we will continue to stress our service department and carry small merchandise to sell across the counter. Then as specialty salesmanship is required again, we will again employ outside salesmen. In fact, I think the heyday of the outdoor solicitor will return as he will have so many new items to sell, appliances which will require active promotion on the part of all manufacturers, utilities, and dealers. We expect to be right in there pitching!"

Mr. Friedman added that furniture dealers and department stores might be able to get their share of the business for refrigerators, washers, and other well established appliances by placing their chief dependence on floor display. But for the new ones such as home freezers, television-radios, and home air conditioners, he thinks the specialty dealers with outside salesmen can skim off the cream of the business. For that reason and others he declares "the sun of the specialty dealer is not setting but rising."

Protection for Electrical Wiring

(*Continued from page 12*)

15 ampere circuit breaker overload protective device.

Now, we have all four requirements for today's ideal breaker. Here, in Figure 6, is what the operating characteristics of such a breaker would look like. It:

1. Gives 100 per cent protection to No. 14 wire.

2. Protects No. 18 wire under most conditions.

3. Allows harmless momentary overloads.

4. Has instantaneous operation starting at current values of approximately 200 amperes.

But the Nofuze breaker is not limited in its application to the protection of No. 14 wire. Similar protection is provided by variously rated trip elements. These are calibrated to protect definite wire sizes and are adjusted so they will not trip the breaker mechanism on momentary safe overloads. But they will always operate before dangerous current values are reached.

Your industry installed the first Nofuze circuit breaker twelve years ago. Since then, more than 7,000,000 power and lighting circuits have been provided with this tamperproof protection.

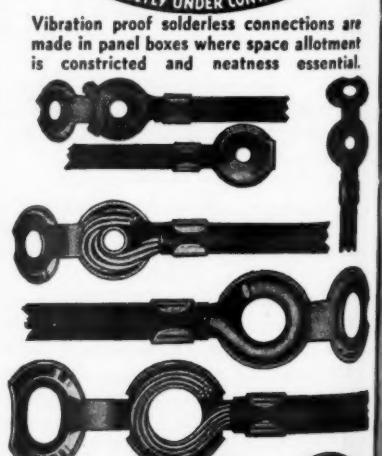
The Nofuze circuit breaker has three very important advantages especially for the central station industry.

1. It eliminates service calls resulting from burned out fuses.

2. It eliminates tampering that destroys circuit protection.

3. It provides complete safety for

Vibration proof solderless connections are made in panel boxes where space allotment is constricted and neatness essential.



WRITE FOR BULLETIN 8-DF

K&H KRUEGER & HUDEPOHL
Solderless Terminal Lugs and Connectors
VINE AT THIRD-ES · CINCINNATI, OHIO

the housewife when restoring service. This means goodwill — an important advantage that cannot be evaluated in dollars.

I can tell you now that the circuit breaker manufacturers have definite plans for intensive postwar promotion. However, we realize where the general public is concerned, demand for circuit breaker protection can be created only by an advertising and educational program designed to make the prospective homeowner Nofuze conscious.

In developing this program, we are in close touch with pre-fabricators, builders and other agencies interested in the postwar housing market. These people are always looking for plus items that will help sell homes.

We have been in consultation with manufacturers who plan marketing new electrical appliances, the installation of which will require the revamping of present wiring systems.

We are conscious of the importance of the complete endorsement of the electrical inspector — the policeman of the industry who is interested in the reduction of fire and personal hazards.

And our contacts with the utilities indicate readiness on their part to cooperate with us. However, we realize this is a program in which the circuit breaker manufacturers must take the lead and provide the type of campaign with which the utilities are willing to fall in line and work shoulder-to-shoulder with us in the interests of public service and our mutual benefit.

Veteran Employment Plan For Electrical Industry

(Continued from page 8)

turn post card, to the Veterans Bureau, USES Offices, USO, local draft boards, and any other centralized location provided for the assistance of returning veterans or war workers seeking new employment. It is felt that quantities of these leaflets can also be attached to car cards which will be used in street cars and buses as part of the publicity campaign.

Presuming that this brochure will create a desire to find employment in the industry, the individual application will be sent with a letter asking the applicant to complete the form and return with it for a personal interview. The ap-

Pedigree

Electrical Insulating VARNISHES

Insure the Life of Your Electrical Equipment

Pedigree Varnishes are prepared with the greatest of care to give them the ability to do the best known job of protecting electrical parts — from oil, greases, acid, alkali, moisture, abrasion, or any other hazard to which your product may be subjected.

There's a Pedigree electrical varnish to meet any situation you may encounter. Whether it's for today's production or tomorrow's plans, specify Pedigree.

The PRODUCT with PEDIGREE

The P. D. GEORGE CO.
5200 North Second Street, St. Louis, Missouri

CHROMALOX
HEATFLO
the replacement electric range unit that
SIMPLIFIES YOUR SERVICE PROBLEM

1200-watt and 2000-watt Heatflo units with snap-on adaptor rings enable service man to fit any range.

Chromalox Super-Speed range units and parts available without priority under WPB Order L-65.

Atlanta, Ga.: C. B. Rogers, 1000 Peachtree St., N.E.
Dallas, Tex.: L. B. Ward, 403 Southland Bldg. Annex.
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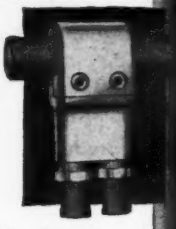
EDWIN L. WIEGAND CO.
7600 Thomas Blvd. Pittsburgh, 8, Penn.

"You have ALL Types of Tees to choose from—

—in the COMPLETE line"

All in one catalog, for your handy selection — *every* good type of tee connector... Each one carefully designed and tested, and manufactured under rigid engineering supervision.



Penn-Union Type HFM, with one-bolt or 2-bolt hinged clamp for the main. One or more branches can be connected afterward. Multi-slit tapered sleeve assures permanent grip on branch.

Penn-Union Hinged E-Z Tee takes a wide range of branch sizes. One-piece design makes installation easy. Tap connections can be made at any time.

Clamp Type Tees for all sizes of tubing and cable—a complete line. Machined contact surfaces.

Types for All Combinations —for connecting flat bar, run or tap, to tubing or cable. Also "general utility" tees that take a wide range of conductor sizes.

Penn-Union E-Z Tee is ideal for accommodating a large range of conductor sizes on both the main and branch. Will not loosen. 2, 3 or 4-post.

L. MORRIS LANDERS
309 Walton Building
ATLANTA, GA.

WALTER J. HUEMMER
Dallas Transfer & Terminal Warehouse Bldg.
DALLAS, TEXAS

PENN-UNION ELECTRIC CORPORATION
ERIE, PA.

PENN-UNION
Conductor Fittings

plication will become part of an employment file, after a personal interview has been had with the applicant. Much better results will be obtained if the league or some central clearing house handles all interviews. One central clearing house will be in a better position to screen the applicant and fit his abilities into the special requirements of each organization or prospective employer. As quickly as this matching of abilities and requirements has been made, the prospective employee will be given letters of introduction to several of the establishments who have need for his services.

It is not expected that a display card in a dealer's store and a booklet in other locations will supply sufficient applicants to take care of the demands of the industry. It will be necessary, therefore, to create wider interest by the use of classified newspaper ads, radio spots, car cards, etc., if we are to get the thousands of applications which it will take to put enough top quality men into the industry within two years.

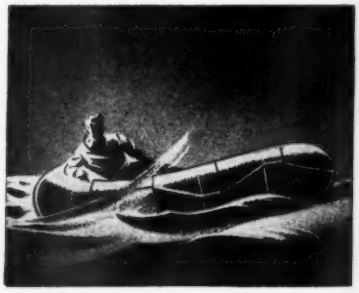
A bulletin prepared periodically listing applications for jobs, (properly keyed, so that names are not mentioned; for easy and quick file finding) should be considered. These bulletins might also be sent to other areas where a hard to place man may have applied for a job and been screened but no local job available—or when a man prefers a job in a location distant from his point of interview. The bulletin should be a complete word picture description of the applicants abilities, desires, personal history, etc.

Equitable Distribution of Applicants

The foregoing sets up the machinery for creating interest in employment within the electrical industry. Knowing that men and women from service and civilian life are and will be seeking new fields of business connections, the next step is to determine which firms in our industry need help, the kind of help, and the details of working conditions, hours, etc.

It is only by a cooperative plan that we can accomplish the necessary screening which is so important where a large number of people and a large variety of skills are under consideration. It will, therefore, be the business principal's job to display the window card in such a way as to attract the attention of as large a group as possible, to make the booklets easily available when a potential employee of the industry steps inside to ask for one, and then to make sure that he fills out the return card which is to be mailed back. All members of every participating organization should be acquainted with the plan in order that potential applicants may meet with due courtesy and understanding in the distribution of the booklets.

As another essential to the success of the program, it is necessary that each participating principal furnish the central clearing office with a list of the number of employees that he is in need of, this list to be divided into skills and further indicate the hours of work and special requirements for each particular job. Upon receipt of these lists they will be broken down into card form within the particular skills common to the industry, forming a file which will be used in matching the skills of the applicants. In this way, each prospective employer will be assured the type of help best suited to its need; and furthermore, avoid putting round pegs into square holes, a thing which is

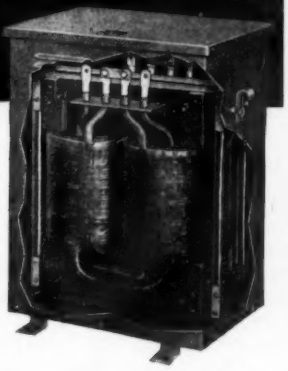


SOMEBODY TALKED!

Loose talk costs lives... Keep working ...Keep Mum.

hotel **Lennox**
St. Louis

FOR EXTRA PROTECTION TO WINDINGS



The above cut-away photo is a 50 K.V.A. Air Cooled Power Transformer manufactured by Jeffries Transformer Company.

DOLPH'S INSULATING VARNISHES

Today it is most essential that transformers are built to withstand temporary power surges and deliver uninterrupted service. It is a known fact that these power surges can prove to be very detrimental to the varnish insulation on coil windings and will tend to lessen the useful service of your equipment.

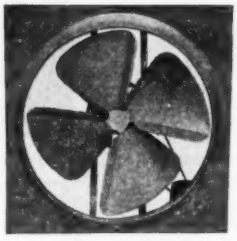
No matter what type of electrical units you manufacture, you will find a DOLPH Insulating Varnish formulated to do a better job by providing the extra protection under severe operating conditions. Why not let us help you with your insulating varnish problems?

Dolph's

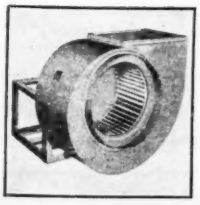
JOHN C. DOLPH COMPANY
Insulating Varnish Specialists
166 Emmet Street, Newark, New Jersey

THE "Fresh-Air MAKER"

provides fully the comfort and ventilation so essential in army barracks, mess halls, hospitals, headquarters, theaters and other military buildings. Its fine design and sound construction meet the specifications drawn for army fans and it is particularly adaptable to the various types of installations found in army buildings.



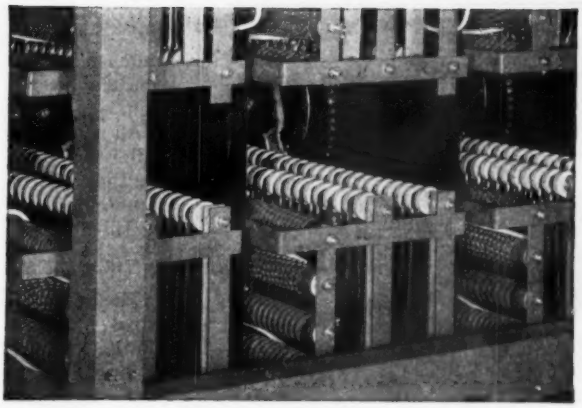
HY-DUTY BLOWERS



Single Inlet—Double Inlet. 400 CFM to 12,500 CFM.

Single Inlet Blower illustrated at left is particularly adapted for ventilation of mess halls in military establishments.

BLOWER DIVISION
SCHWITZER-CUMMINS COMPANY
1145 EAST 22ND STREET INDIANAPOLIS, U. S. A.

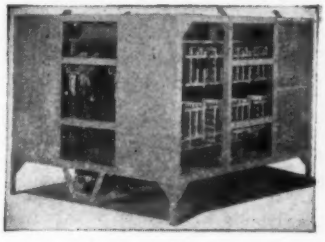


ADAPTABLE *and* DEPENDABLE
RESISTORS

ADAPTABILITY and dependability of resistors assume primary importance in the assembly of large rheostat control units. The wide range of resistance values and capacities that can be built up from the Ward Leonard line is limitless. The many types and mounting arrangements permit the meeting of load requirements in minimum space. It is obvious in an assembly as shown above that the dependability of the individual resistor is an absolute essential.

For over fifty years industry has looked to Ward Leonard for both resistors and resistor assemblies. This experience has given Ward Leonard Engineers the viewpoint of user and designer. It is reflected in the completeness of the Ward Leonard line of Resistors.

Whatever your requirements you will find a Ward Leonard Resistor that exactly meets your conditions. Send for Bulletins.



This motor operated Ward Leonard assembled rheostat is built up from several types of Ward Leonard Resistors.

ARMY E NAVY

WARD LEONARD

RELAYS • RESISTORS • RHEOSTATS

Electric control (WL) *devices since 1892.*

WARD LEONARD ELECTRIC COMPANY
37 SOUTH STREET, MT. VERNON, NEW YORK

TOP MAN

Your T&B Distributor

He knows how to measure and supply *all* your electrical needs for Reconversion. Call him in now for the help he can give you.

He knows which manufacturers make what. He saves you time and money. He brings you the latest developments in the industry. As you get going again, he watches your production schedules, and carries in *his* inventory the electrical materials and equipment you require.

No one manufacturer nor a dozen can give you the same personal interest and resourcefulness as he can.

The Thomas & Betts Co. makes thousands of electrical fittings of all types, styles and sizes to button up your conductors and their raceways. Under the T&B Plan, we distribute all of them exclusively through T&B Wholesalers' service organizations.

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Atlanta 3, Ga.

The Thomas & Betts Co.,
Incorporated
P. O. Box 2372
Charlotte, North Carolina

The Thomas & Betts Co.,
Incorporated
518 Masonic Temple Bldg.
New Orleans 12, La.

T&B

THE THOMAS & BETTS CO.
INCORPORATED
manufacturers of electrical fittings since 1899
ELIZABETH, 1, NEW JERSEY
In Canada: Thomas & Betts Ltd., Montreal

very common unless the applicants are screened, and the skills are matched before giving the prospective employee a letter of introduction.

All participating member firms will receive the form asking them for their list of help wanted at the same time. Requests for help will be filled in order of their receipt.

National Effect of Local Effort

The local facilities of the electrical industry, the League or a similar clearing house, may interchange data or other information with other areas. By such an exchange a National Program will be established and permit an applicant in one section of the country to find employment in his chosen locality. The prospective employer might also locate a hard to find employee in a different area than his location would usually draw from.

Some compensation or reciprocal arrangement could be effected between clearing houses to equalize participation costs for these so-called foreign or distant placements.

One of the intangible but none the less important and valuable gains through this program will be the creating of better public relations with the consuming public.

Fluorescents for Printers Raises Over-All Efficiency

(*Continued from page 10*)

an air conditioner, which was considerably overloaded due to the terrific heat load in this room. The wattage decrease, of course, helped to relieve this condition somewhat."

The Oklahoma Gas and Electric Co. investigated conditions under the old lighting at the request of L. S. Vance, assistant business manager of the Oklahoma Publishing Co., who expresses himself as well pleased with the greatly increased efficiency of the new fluorescent lighting system. The old 300-watt incandescent lamps were placed on 10 foot by 12 foot centers in ceiling-type, 16-inch direct lighting enclosing globes. The electrical contractor found it unnecessary to reduce the ceiling spacing of the lamps or to increase the wiring except for making a few minor wiring additions to bring some of the lamps nearer to working levels. Thus a reduction of wattage and three times the lighting efficiency were accomplished without placing a strain on the old wiring system.

Some of the new fluorescent lamps were placed on the ceiling, others were dropped to about nine feet above the working levels, while still others were placed in metal hoods about three feet above the make-up tables and ad cases. These hoods were utilized from the old system.

The new 100-watt fluorescent lamps are placed in Guth reflectors. A sufficient number of these are placed at the ceiling level to give adequate general illumination, while the others are dropped to a position which will reflect the light directly to the working tables or the various machines in order to produce the greatest degree of working ease and efficiency. Excess absorption of light in the ceiling, experienced with the old lamps and reflectors, is eliminated in the new installations.

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ANTI-CORROSIVE PAINTS
favored for
TRANSMISSION
and
DISTRIBUTION DEPARTMENTS
MAINTENANCE

Subox, Inc.
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FOR SALE

Well Established Electrical Business in a thriving East Texas town. Best business town in East Texas. Nice store, 16'x60', ideal location, low rental, well stocked, doing a nice volume of store sales and repairs of light appliances. A nice set-up to be handled profitably by two people. Reason for selling is that owner's time must be put to other business interests.

VELDA ELECTRIC COMPANY
115 N. Bois d'Arc Ave. Tyler, Texas

TOOLS

Channelock Pliers, Crescent Wrenches, Visegrips, Open-Box Sockets, Needle Nose, Pipe Wrenches, Diagonals, Screw Extractors, Screwdrivers, Pullers. Prompt Shipment. Order today. C.O.D. Catalog Free. Dealers Tool Supply, Dept. E.S., 1527 Grand, Kansas City, Missouri.

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MACALLEN *Mica*
FOR EVERY
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MICA PLATE
Moulding, Segment, Flexible, and Heater
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AUTOMATIC ELECTRIC Sepco WATER HEATER

We are now prepared to accept orders for the well known Sepco Automatic Electric Water Heater.

. . . INQUIRIES GLADLY RECEIVED . . .

Automatic Electric Heater Co., Inc.
Pottstown, Montgomery County, Pennsylvania

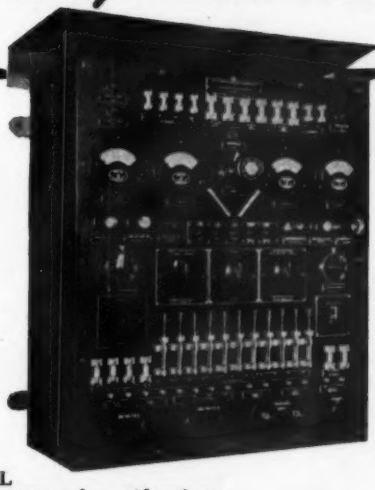
INVENTION NEEDED

Established, well financed manufacturer with national distribution is interested in new products for postwar manufacture and sale. Interested primarily in domestic electrical appliances. State nature of device but *do not send drawings or details unless patented.*

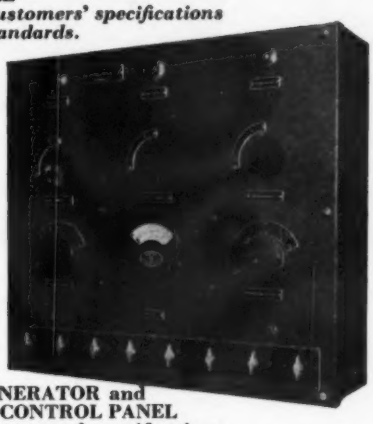
P.O. Box 322 Rochester 2, N.Y.

Electrical Specialties
of Every Type
Including MARINE WORK

JMM CO



WORK
TEST PANEL
—built to customers' specifications and Navy standards.



RADIO
MOTOR-GENERATOR and
SELECTOR CONTROL PANEL
—built to customers' specifications for any number of circuits.

ALL types of electrical specialties, boxes, cabinets, control panels, duct-work, etc., manufactured by an organization accustomed to meeting exacting Army, Navy and Commercial specifications. Full engineering personnel and equipment for manufacture of special electrical items to customers' needs in addition to all standard articles. Let us quote you on your requirements. Write for illustrated catalog.

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JACKSONVILLE
METAL MANUFACTURING CO.
247 RIVERSIDE AVE., JACKSONVILLE, FLORIDA

Record Breaking Orders *Prove Trade Acceptance*

Lloyd New *Automatic* Starter

In the *New* RED PLASTIC Can

Listed & approved by Underwriters' Laboratories, Inc.

Submitted to Electrical Testing Laboratories, Inc., for certification.

PAT. NOS. 2200443 - 2228210

Locks Out---Resets Automatically

1. Positively cuts out deactivated, flickering, blinking lamps.
2. When trouble is detected the starter automatically cuts off current to the ballast and lamp.
3. Gives long life to ballast because defective lamp is locked out. Prevents overheating.
4. When Lloyd AUTOMATIC locks out defective lamp—Turn off the current—Remove defective lamp—Put in a new lamp. Allow at least one minute to make the above change of lamps. Turn on the current. The starter automatically lights the new lamp. NO NEED TO DO ANYTHING TO STARTER.
5. Lloyd NEW PLASTIC CAN has higher dielectric strength, is stronger, lighter, distinctive.
6. Knurled rim on plastic can insures positive grip for insertion and removal of starter.
7. Plastic can is sealed. No projecting lugs to cause trouble.
8. The life of the AUTOMATIC starter is many times greater than that of the average lamp.
9. It saves maintenance costs and power consumption, protects and insures longer life to the ballast and lamp.
10. Tested in production and prior to shipment to insure perfect performance.

LLOYD PRODUCTS COMPANY
Dept ES-11 Providence 5, R. I.
Representatives in 23 Leading Cities.
Export Office 13 E. 40th St., N. Y. C.

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